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Agenda items: 3, 4, 6

ARGOS-JTA-XX/6
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English only

INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION (of UNESCO)

WORLD METEOROLOGICAL ORGANIZATION

Twentieth Meeting on Argos Joint Tariff Agreement

(Victoria, BC, Canada, 23-26 October 2000)

SUMMARY REPORT FROM CLS/SERVICE ARGOS

As for past JTA meetings, this document contains, in consolidated form, the summary report from CLS/Service Argos, covering: Report on the 2000 Global Agreement; Report on 2000 operations; System Improvements; and Review of the Structure of the Tariff Agreement and related matters.

The JTA meeting will be invited to note the reports and take the information into account when discussing the relevant agenda items.

00 Summary Report

Report on the 2000 Global Agreement

Report on 2000 operations

System Improvements

Review of the structure of the tariff agreement and related matters

REPORT ON THE 2000 AGREEMENT

1. FINAL PARTICIPATION IN THE AGREEMENT

On July 31 2000, the list of individual agreements actually signed with CLS/Service Argos was as follows:

Countries	PTT.Yrs
AUSTRALIA	40.5
BRAZIL	12
BURKINA	10.8
CANADA	67
CHINA	2.37
DENMARK	8.05
FINLAND	2.35
FRANCE	82
GERMANY	51.8
ICELAND	4.5
INDIA	10
ITALY	11
KOREA	3
NETHERLANDS	13.7
NEW ZEALAND	9.3
NORWAY	18.5
PAKISTAN	1.6
SOUTH AFRICA	38
SPAIN	4.85
SWEDEN	3
TAIWAN	1
TUNISIE	3
UK	50
UND ARAB EMTS	5
USA	661.5
Total	**1114.8**

table 1

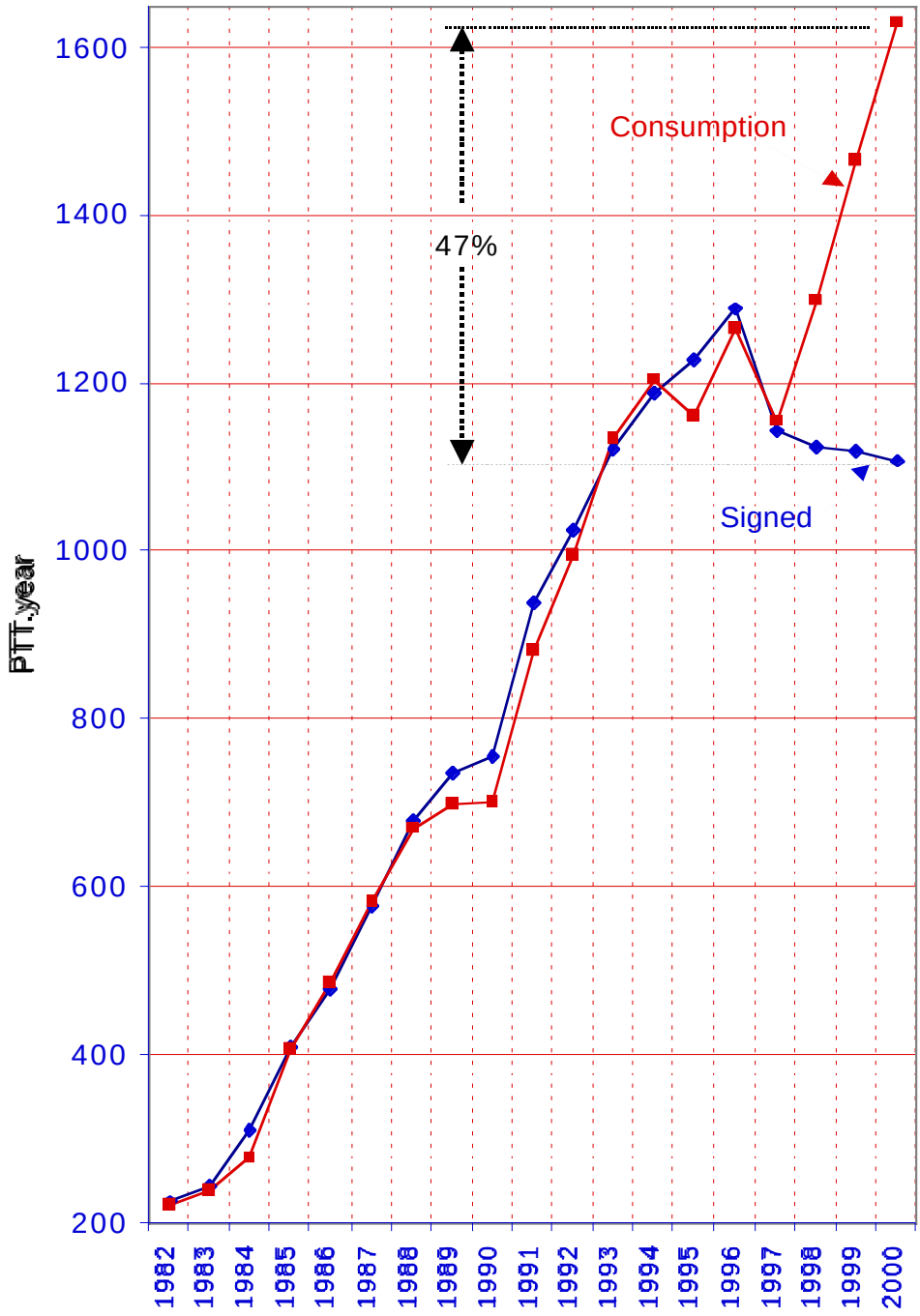
2. ACTIVITY UNDER THE 2000 AGREEMENT

Countries	PTT.yrs july 2000
AUSTRALIA	38.6
BRAZIL	11.0
BURKINA	8.4
CANADA	67.7
CHINA	2.1
DENMARK	12.0
FINLAND	2.6
FRANCE	69.8
GERMANY	40.1
ICELAND	3.9
INDIA	10.8
ITALY	11.1
KOREA	4.3
NETHERLANDS	11.0
NEW ZEALAND	12.0
NORWAY	22.5
PAKISTAN	0.5
SOUTH AFRICA	34.4
SPAIN	3.4
SWEDEN	1.9
TAIWAN	1.1
TUNISIE	3.3
UK	79.9
UND ARAB EMTS	4.7
USA	1174.0
Total	**1631.0**

table 2.1

The mean overall activity over the first seven months is 1631 PTT.years or 146 % of the total contracted number.

2.1 Impact of the bonus on overall PTT-years consumption



Curve 2.1: PTT-Yr signed and consumption since 1982

The curve 2.1 shows clearly the impact of the bonus on the consumption over year 1998, 1999 and seven months in 2000.

3. 1998, 1999 AND 2000 AGREEMENT

3.1. Basic principles

Agreement reached at the seventeenth JTA meeting (La Réunion, October 1997, paragraph 5.5 of the final report):
" the basic principles for the 1998 and 1999 JTAs at least should be:

(i) that each ROC had essentially a fixed amount of money to pay to Argos for 1998, the total of which would most likely cover Argos operating costs for that year, based on an unchanged cost per PTT year

(ii) that for this amount each ROC would be allowed a certain percentage increase (bonus) in PTT year usage in 1998, nominally 35%, without further charge or penalty,

(iii) that this increase could be compounded over two years, provided the sum guaranteed to be paid to Argos did not decrease in 1999 from that guaranteed at JTA-XV1I,

(iv) that if the PTT years finally agreed on 15 January 1998 and/or 1999 by each ROC amounted to less than the PTT/years confirmed and recorded at the present meeting by the ROC, then the bonus would no longer apply to that country.

The JTA - XIX meeting(Wellington, New Zealand, November 1999)
a) reconfirmed the decision that the total bonus should continue to apply for those countries with signed PTT-years in 2000 at least equal to the base figure in the JTA-XVII bid.

b) As an exception for 2000 only, for those ROCs that had not been able to take advantage of the bonus since its inception in 1998, it was decided to allow a bonus of 35% over the signed figure in 2000, should this figure exceed the figure in the 1999 agreement.

3.2. Application of the PTT-years 35 % compounded bonus

3.2.1 Situation of Agreements per country

Acording to basic principles in § 3.1 the "bonus situation" is given in the table below.

Countries	Agreed in oct 97 PTT.Yrs	Signed in 1999 PTT.Yrs	Signed in 2000 PTT.Yrs	35% compounded bonus for 2000	35% bonus for 2000
AUSTRALIA	53.00	53.00	40.50	no	
BRAZIL	12.00	16.00	12.00	yes	
BURKINA	14.00	10.80	10.80	no	
CANADA	64.00	67.00	67.00	yes	
CHINA	1.50	3.00	2.37	yes	
DENMARK	11.00	11.00	8.05	no	
FINLAND	1.45	1.60	2.35	yes	
FRANCE	80.50	81.00	82.00	yes	
GERMANY	43.20	38.80	51.80		yes*
ICELAND	7.00	8.50	4.50	no	
INDIA	10.00	10.00	10.00	yes	
ITALY	12.00	13.50	11.00	no	
KOREA	5.00	5.00	3.00	no	
NETHERLANDS	15.47	11.00	13.70		yes*
NEW ZEALAND	9.30	9.30	9.30	yes	
NORWAY	21.50	21.50	18.50	no	
PAKISTAN	1.60	1.60	1.60	yes	
SOUTH AFRICA	38.00	38.00	38.00	yes	
SPAIN	1.25	1.95	4.85	yes	
SWEDEN	2.50	3.00	3.00	yes	
TAIWAN	3.00	3.00	1.00	no	
TUNISIE	3.00	3.00	3.00	yes	
UK	50.00	50.00	50.00	yes	
UND ARAB EMTS	3.50	4.50	5.00	yes	
USA	655.00	661.50	661.50	yes	
Total	**1119**	**1128**	**1115**		

table 3.2.1

3.3.2 Impact of the 35% bonus on PTT-years consumption per country

The total consumption in PTT-years was:
- in 1999: 30 % (339 Ptt-year)higher than the total signed.
- in july 2000: 46 % (516 Ptt-year) higher than the total signed.

In july 2000, the consumption of 15 countries (among 17 bonus allowed) was exceding their signed amount.

Countries	Agreed in oct 97 PTT.Yrs	Signed in 1999 PTT.Yrs	Bonus	Activity in 1999 PTT.Yrs		Signed in 2000 PTT.Yrs	Bonus	Activity in 2000 PTT.Yrs	
								july 2000	
AUSTRALIA	53.00	53.00	yes	47.94	-10%	40.50	**no**	38.59	-5%
BRAZIL	12.00	16.00	yes	14.14	-12%	12.00	yes	10.99	-8%
BURKINA	14.00	10.80	**no**	9.17	-15%	10.80	**no**	8.35	-23%
CANADA	64.00	67.00	yes	73.77	**10%**	67.00	yes	67.74	**1%**
CHINA	1.50	3.00	yes	2.36	-21%	2.37	yes	2.14	**-10%**
DENMARK	11.00	11.00	yes	13.82	**26%**	8.05	**no**	12	**49%**
FINLAND	1.45	1.60	yes	2.16	**35%**	2.35	yes	2.58	**10%**
FRANCE	80.50	81.00	yes	87.36	**8%**	82.00	yes	69.84	-15%
GERMANY	43.20	38.80	**no**	38.32	-1%	51.80	yes*	40.1	-23%
ICELAND	7.00	8.50	yes	14.05	**65%**	4.50	**no**	3.86	-14%
INDIA	10.00	10.00	yes	10.85	**9%**	10.00	yes	10.8	**8%**
ITALY	12.00	13.50	yes	12.69	-6%	11.00	**no**	11.11	**1%**
KOREA	5.00	5.00	yes	6.56	**31%**	3.00	**no**	4.25	**42%**
NETHERLANDS	15.47	11.00	**no**	8.8	-20%	13.70	yes*	10.96	-20%
NEW ZEALAND	9.30	9.30	yes	12.2	**31%**	9.30	yes	12.04	**29%**
NORWAY	21.50	21.50	yes	21.13	-2%	18.50	**no**	22.54	**22%**
PAKISTAN	1.60	1.60	yes	0.57	-64%	1.60	yes	0.45	-72%
SOUTH AFRICA	38.00	38.00	yes	42.25	**11%**	38.00	yes	34.37	-10%
SPAIN	1.25	1.95	yes	2.25	**15%**	4.85	yes	3.39	**-30%**
SWEDEN	2.50	3.00	yes	5.34	**78%**	3.00	yes	1.9	-37%
TAIWAN	3.00	3.00	yes	1.35	-55%	1.00	**no**	1.12	**12%**
TUNISIE	3.00	3.00	yes	3.1	**3%**	3.00	yes	3.32	**11%**
UK	50.00	50.00	yes	70.5	**41%**	50.00	yes	79.93	**60%**
UND ARAB EMT	3.50	4.50	yes	4.69	**4%**	5.00	yes	4.69	-6%
USA	655.00	661.50	yes	961.3	**45%**	661.50	yes	1173.96	**77%**
Total	**1119**	**1128**		**1467**	**30%**	**1115**		**1631**	**46%**

table 3.2.2 (yes means 35% bonus)*

	1982		1983		1984		1985		1986		1987		1988		1989		1990		1991		1992		1993		1994		1995		1996		1997		1998		1999		2000	
			SIG.	ACT.	SIG.	ACT.	SIG.	ACT.	SIG.	ACT.	SIG.	ACT.	SIG.	ACT.	SIG.	ACT.	SIG.	ACT.	SIG.	ACT.	SIG.	ACT.	SIG.	ACT.	SIG.	ACT.	SIG.	ACT.	SIG.	ACT.	SIG.	ACT.	SIG.	ACT.	SIG.	ACT. July -
AUSTRALIA	11.0	11.0	9.0	7.8	17.0	8.7	15.0	15.0	22.0	22.6	30.0	27.0	25.0	19.1	19.0	13.9	28.7	21.3	28.4	23.1	37.0	29.8	33.0	34.4	44.5	42.4	50.0	41.5	56.4	50.02	56.5	47.0	53.0	45.5	53.0	47.94	40.50	38.6
BRAZIL																	2.0	1.2	2.0	1.3	5.0	2.2	12.0	10.1	14.0	10.7	13.0	11.0	13	9.40	14.0	9.7	12.0	11.7	16.0	14.14	12.00	11.0
BURKINA FASO				9.8	1.5	0.9	1.5	1.2	1.5	1.4	2.0	2.3	2.0	3.5	3.5	5.5	5.0	5.2	6.5	5.3	6.5	5.8	7.5	10.9	7.5	12.8	13.0	11.6	14	11.86	14.0	12.3	13.0	11.8	10.8	9.17	10.80	8.4
CANADA	10.0	10.0	10.0		12.0	15.0	32.0	34.8	40.0	27.0	31.0	40.4	44.0	43.5	49.0	38.3	34.0	39.6	85.0	83.0	104.0	97.7	90.0	96.7	80.0	91.2	85.0	90.1	80.0	75.1	64.0	67.1	64.0	72.1	67.0	73.77	67.00	67.7
CHINA											6.0	3.5	7.0	4.4	5.0	3.2	5.0	5.9	6.5	5.0	5.0	3.2	3.5	3.8	3.0	4.0	3.0	2.9	3.0	3.0	1.5	1.5	1.5	1.1	3.0	2.36	2.37	2.1
DENMARK			1.0	3.0	3.0	4.8	6.0	5.9	6.0	6.4	6.0	6.8	7.0	7.3	10.0	11.6	10.0	9.8	3.0	2.8	2.8	2.3	3.5	4.9	6.5	5.2	6.2	5.6	10.0	8.1	11.8	8.6	12.4	12.3	11.0	13.82	8.05	12.0
FIJI																					4.0	3.3	1.8	1.6	0.5	0.9	0	0	0	0	0	0	0	0	0	0	0	0
FINLAND																					3.6	2.3	0.9	1.8	1.0	2.3	0.9	0.9	4.0	7.2	1.6	4.2	2.2	3.4	1.6	2.16	2.35	2.6
FRANCE	25.0	25.0	35.0	24.0	45.5	33.5	44.0	39.0	55.0	51.9	56.0	45.5	58.0	43.8	66.6	59.7	64.2	59.2	73.8	58.5	71.6	59.1	115.0	93.0	93.6	82.3	81.5	47.0	65.4	64.0	82.8	79.2	81.0	91.4	81.0	87.36	82.00	69.8
GERMANY	21.0	21.0	20.0	29.4	20.0	22.0	20.0	30.9	24.0	32.7	28.0	51.0	38.0	44.2	35.0	49.9	31.0	37.5	50.0	45.3	73.0	70.2	56.0	66.8	70.0	71.8	62.0	55.2	40.0	42.9	43.0	37.2	43.2	33.3	38.8	38.32	51.80	40.1
ICELAND											1.0	0.5	1.0	0.5	1.0	0.5	1.0	0.4	1.0	0.6	1.0	0.3	1.0	0.4	2.0	3.3	3.0	2.2	6.0	4.5	7.0	5.7	7.5	6.2	8.5	14.05	4.50	3.9
INDIA																			8.0	1.6	8.0	5.0	8.0	2.6	8.0	6.1	8.0	6.8	8.0	8.0	10.0	6.2	10.0	8.2	10.0	10.85	10.00	10.8
ITALY											1.0	0.7	2.0	0.4	2.0	1.2	2.0	0.2	4.2	7.0	14.4	14.0	24.3	22.9	22.1	20.2	24.9	25.3	17.5	15.6	12.8	12.9	13.5	13.2	13.5	12.69	11.00	11.1
KOREA																					2.3	2.1	2.3	3.2	2.7	4.9	5.5	3.4	7.5	4.2	6.5	9.2	4.0	6.1	5.0	6.56	3.00	4.3
MALAYSIA																									1.4	0.3	0.8	0	0.8	0	0	0	0	0	0	0	0	0
NETHERLANDS			1.0	0.9	1.0	0.9	2.0	1.5	2.0	0.8	3.0	1.8	4.0	3.3	3.0	2.6	7.0	4.2	8.0	4.6	4.5	1.8	5.0	7.1	7.5	5.0	11.5	5.3	18.4	12.3	14.0	7.0	15.5	12.4	11.0	8.80	13.70	11.0
NEW ZEALAND					2.0	0.1	2.0	1.4	3.0	5.5	3.0	3.6	4.0	5.1	5.5	5.0	3.8	5.5	6.5	6.2	7.0	6.5	7.0	7.2	7.6	7.5	8.5	9.1	11.1	11.4	9.8	10.2	9.3	8.8	9.3	12.20	9.30	12.0
NORWAY	10.0	10.0	20.0	18.3	17.5	19.5	19.5	15.3	28.0	20.2	21.0	26.0	18.0	15.8	25.0	24.7	31.0	22.0	32.0	24.0	26.0	31.6	42.0	42.4	32.5	31.4	31.0	24.0	27.0	26.1	28.5	26.8	21.5	16.3	21.5	21.13	18.50	22.5
PAKISTAN																					0.7	0.5	1.7	1.0	1.7	1.6	1.8	0.8	1.8	0.6	1.6	0.2	1.6	0.6	1.6	0.57	1.60	0.5
PORTUGAL	0	1.0	1.0	1.4							0.5	0	2.0	0.6	2.0	2.0	1.0	1.0	1.0		1.0	0	5.0	4.1	5.0	2.5	0	0	0	0	0	0	0	0	0	0	0	0
SAUDI ARABIA							5.0	1.5			1.0	1.8	1.0	0.4			1.3	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SOUTH AFRICA	11.0	12.0	14.0	8.8	16.0	14.3	19.0	15.0	16.0	7.8	10.0	3.1	16.0	2.8	7.0	1.3	13.0	8.2	14.0	7.5	13.0	7.8	13.0	11.7	15.0	12.3	22.0	23.1	25.0	26.5	34.0	30.0	38.0	55.2	38.0	42.25	38.00	34.4
SPAIN																	0	0	0		0	0	1.7	0	1.7	0.4	1.5	1.2	2.8	3.6	1.5	1.6	3.6	4.7	1.95	2.25	4.85	3.4
SWEDEN																			3.0	2.1	1.0	1.2	2.0	1.4	2.0	1.3	1.0	1.0	2.0	1.8	3.0	2.2	3.0	4.9	3.0	5.34	3.00	1.9
TAIWAN																									8.5	3.1	2.0	2.3	2.0	0.8	3.0	0.6	3.0	1.8	3.0	7.35	1.00	1.1
THAILAND																											9.5	1.6	2.5	4.4	0	0	0	0	0	0	0	0
TUNISIA																									2.0	2.1	2.0	2.6	2.0	2.9	3.0	3.2	3.0	3.5	3.0	3.10	3.00	3.3
UNITED ARAB EMIRATS																											2.5	1.8	2.5	2.24	3.0	3.0	3.5	4.8	4.5	4.24	5.00	4.7
UNITED KINGDOM	7.0				11.0	8.2	9.0	4.6	8.5	10.8	14.5	14.2	13.0	15.5	22.0	21.0	21.0	21.0	22.0	19.2	25.0	49.2	46.0	45.3	64.0	48.1	63.0	66.0	61.8	87.0	42.9	55.7	50.0	61.1	50.0	70.50	50.00	79.9
USA	132	132	133	137	165	149	234	242	275	299	365	355	438	460	480	460	495	460	585	585	600	600	643	661	685	732	715	721	805	784	675	714	655	808.4	655	961	655	1174
TOTAL	227	222	244	240	312	277	409	408	481	486	579	583	680	670	736	700	756	702	940	943	1025	996	1122	1134	1189	1205	1228	1163	1289	1267	1145	1154	1124	1299	1121	1467	1108	1631

table 4.1

SIGN: number of Ptt-year signed
ACT: number of Ptt-year activity

ACTIVITY OF JOINT TARIFF AGREEMENT FROM 1983 TO 2000

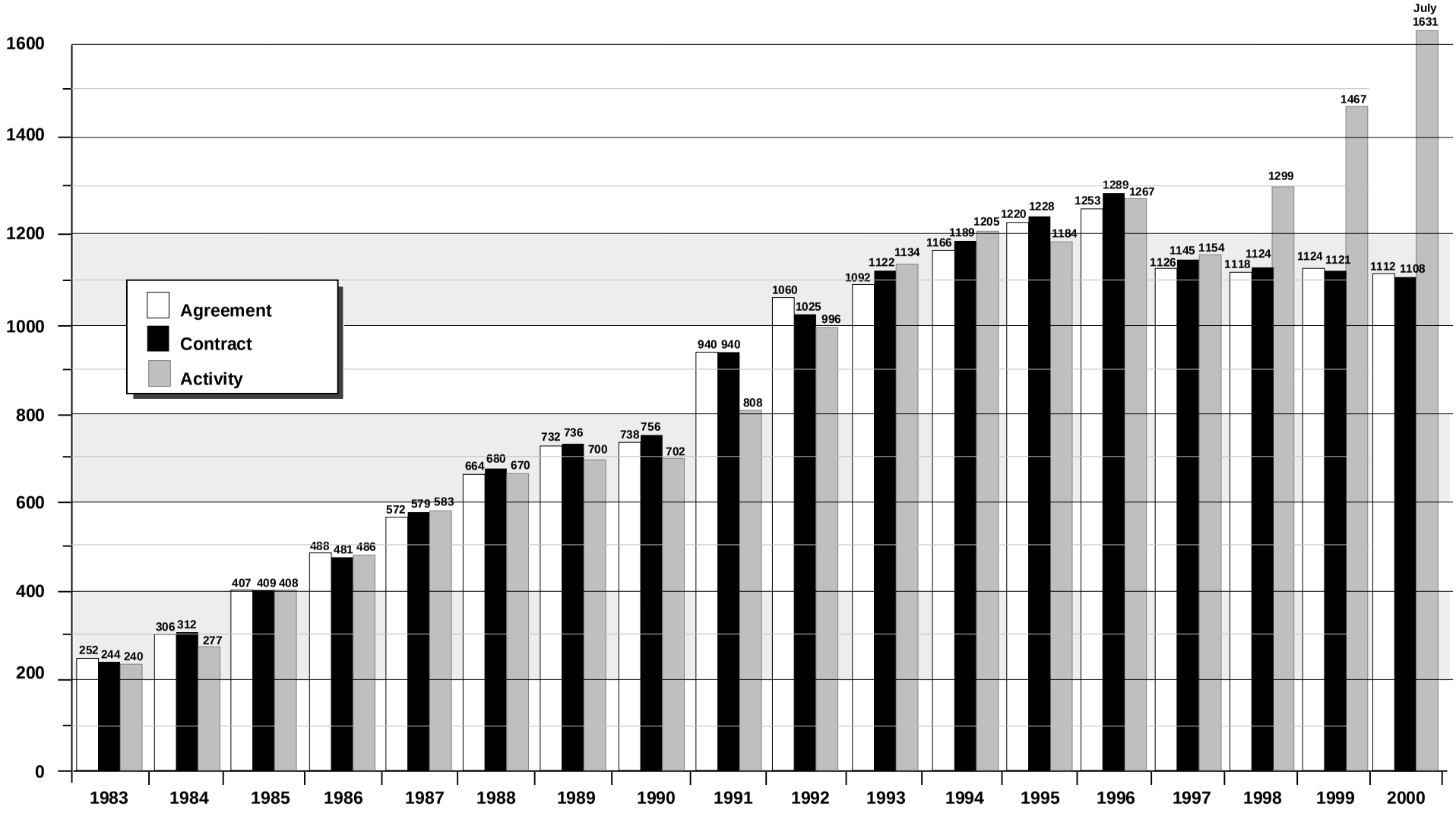


table 4.2

REPORT ON 1999-2000 OPERATIONS

1 - SYSTEM OPERATIONAL STATUS

1.1 - Ground receiving stations

1.1.1 - Global receiving stations

During the course of 1999, Fairbanks stopped sending us STIP data sets from NOAA-12 (D). At the same time, Wallops Island only delivered two STIP orbits a day for this satellite.
Consequently, instead of receiving 24 hours of data we now only have three hours, which is not nearly sufficient for the precise orbit determination for NOAA 12 (D), required to supply our users with good location data.

Since NOAA-15 (K)'s frequency was changed, Lannion is no longer able to provide STIP data sets for this satellite.

Figure 1.1.1 shows STIP data set arrival times at the Toulouse and Largo processing centers.

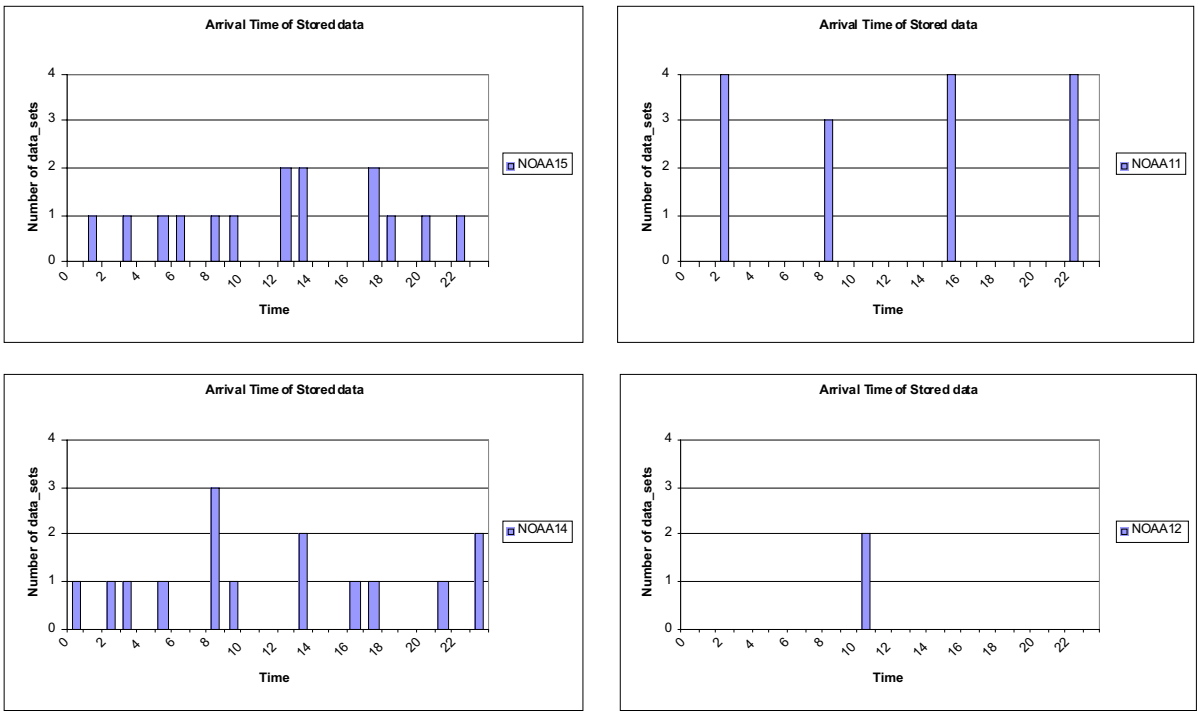


figure 1.1.1.a:

1.1.2 Regional receiving stations

CLS and Service Argos Inc. pursued their efforts in 1999 and 2000 to secure new cooperation agreements with a number of organizations to increase the number of receiving stations able to provide TIP data sets from the NOAA satellites.
Today, 21 stations deliver TIP data sets to CLS and Service Argos Inc. This is an increase of 3 stations from last year.

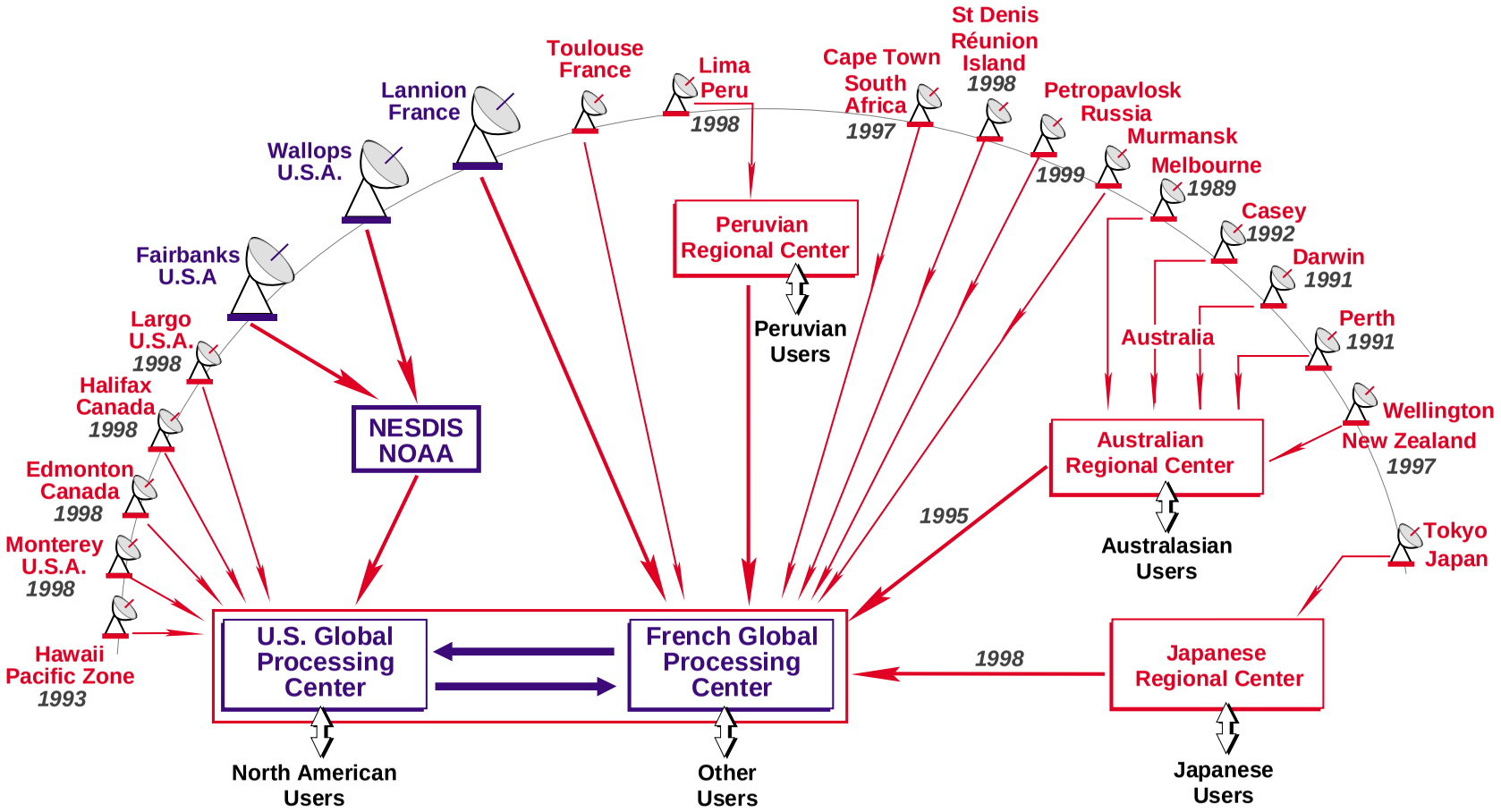
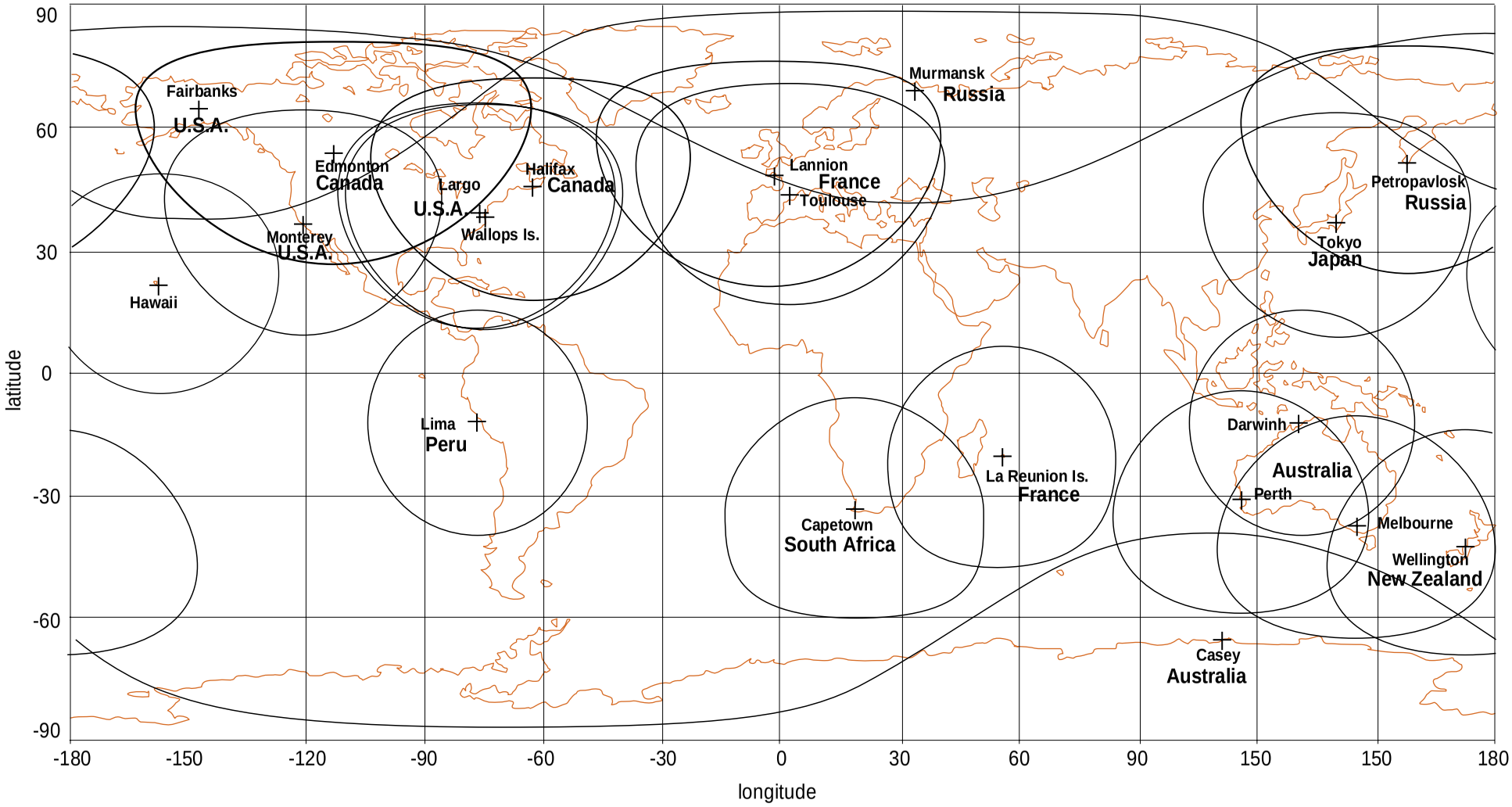


figure 1.1.2.a: Regional receiving station network



1.1.2.b Argos regional coverage

2000 **Regional stations**	**Country**	**Operator**	**Satellites**
Cape Town	South Africa	CLS/SAWB	NK, NJ, ND, NH
Melbourne	Australia	BOM	NK, NJ, ND
Darwin	Australia	BOM	NK, NJ, ND
Perth	Australia	BOM	NK, NJ, ND
Casey	Australia (Antarctica)	BOM	NK, NJ, ND
Lannion	France	Météo France	NK, NJ, ND
Reunion Island	France	Météo France	NK, NJ, ND
Wellington	New Zealand	Met Office	NK, NJ, ND
Gilmore	USA	NOAA	NK, NJ, ND
Wallops	USA	NOAA	NK, NJ, ND
Miami	USA	NOAA	NK, NJ
Toulouse	France	CLS	NK, NJ, ND, NH
Largo	USA	SAI	NK, NJ, ND, NH
Lima	Peru	CLS perù	NK, NJ, ND,NH
Murmansk	Russia	Complex System	NK, NJ, ND,NH
Petropavlosk	Russia	Rybradion	NK, NJ, ND,NH
Tokyo	Japan	Jamstec	NK, NJ, ND, NH
Halifax	Canada	Environment Canada	NJ, ND
Edmonton	Canada	Environment Canada	NJ, ND, NH
Hawaï	USA	National Weather Serv.	NK, NJ, ND
Monterey	USA	National Weather Serv.	NJ, NK

figure 1.1.2.c

Table 1.1.2.c gives the list of regional receiving stations with their location, the organisation responsible for operation and which satellitesare received.
Unfortunately, not all these regional stations receive data sets from all four satellites (NOAA-15, NOAA-14, NOAA-12 and NOAA-11).
For example, many do not receive data from NOAA-11 because the AVHRR instrument is inoperative.
Other stations can no longer receive data from NOAA-15 since the frequency of the HRPT channel was changed.

1.2 Processing centers

1.2.1 General

Each of the five Argos processing centers in Toulouse, Largo, Melbourne, Tokyo, and Lima operated without a major hitch in 1999.

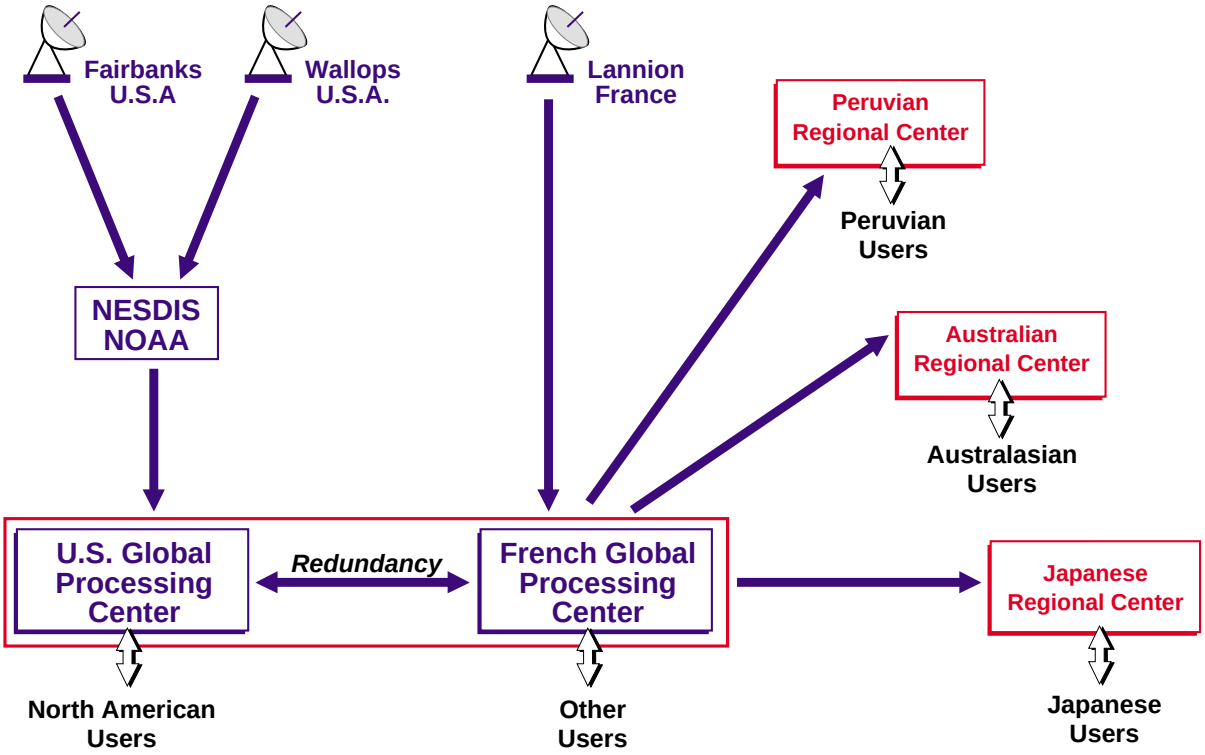


figure 1.2.a: Argos processing facilities NOAA satellite global coverage

1.2.2: Operations

In Toulouse, we have resolved the problems encountered with our backup power supply in 1998. The system is now working perfectly.
The two global processing centers in Toulouse and Largo continue to process data sets from all receiving stations, which is a total of 270 data sets per day

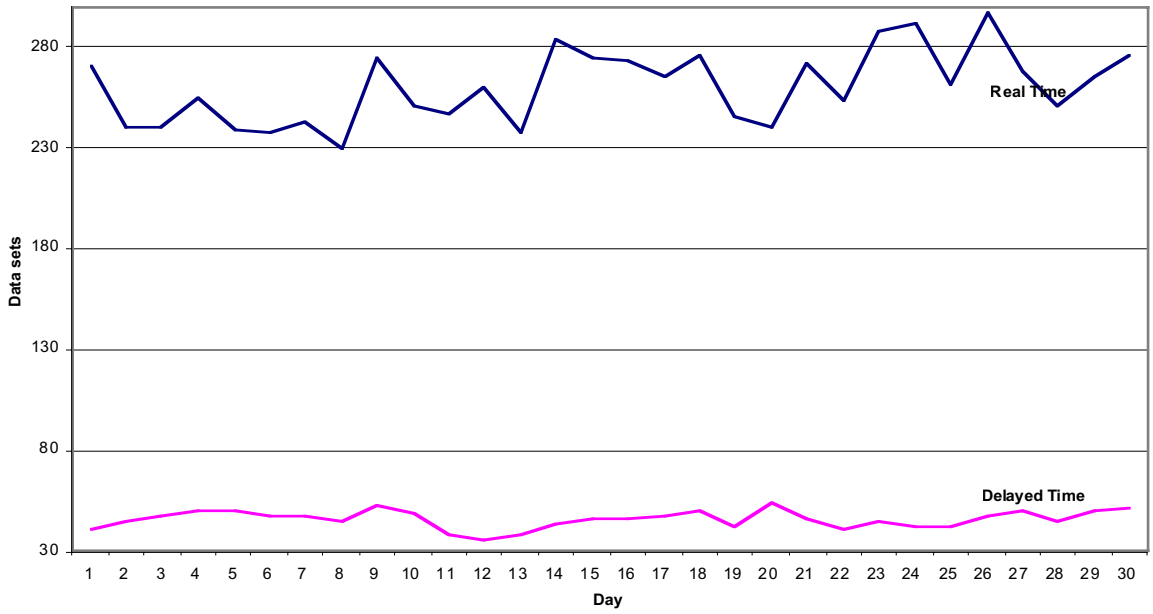


figure 1.2.2.a

Due to the large number of receiving stations and because each station tracks three or four satellites, the global processing centers in Toulouse and Largo are now having to process more and more regional real time data sets (ie data received during the 10-12 minutes of a satellite pass over a receiving station.)

Figure 1.2.2.a shows the number of regional real time data sets and global stored data sets processed every day by the Toulouse and Largo centers.

1..3 Space segment

1.3.1. Operational satellites

NOOA-16 (L) was launched on sept. 20, 2000 and will replace NOAA-14 (J) as one of the two NOAA operational satellites.
NOAA-15 (K) and NOAA-14 (J) have been operating nominally, as primary satellites, since December 1st , 1998 and December 30, 1994, respectively (see table 1.3.2a)

1.3.2. Others Satellites

NOAA 11(H) is the secondary satellite. Its global data is transmitted according to the " third satellite " transmission characteristics
NOAA 12(D) is on " stand by " status, with a nominal Argos equipment operating in direct transmission mode.
NOAA 9 (F) and 10 (G) were decommissioned.

Satellite status	May 98	December 98	October 99		2000
Under Test		15 - NOAA K			
Operational	14 - NOAA J (1) 12 - NOAA D (1)	14 - NOAA J (1) 12 - NOAA D (1)	15 - NOAA K (1) 14 - NOAA J (1)	15 - NOAA K (2) 14 - NOAA J (1)	15 - NOAA K (2) 14 - NOAA J (1)
Back up Third satellite	11 - NOAA H (3) 10 - NOAA G (4)	11 - NOAA H (3) 10 - NOAA G (4)	11 - NOAA H (3) 12 - NOAA D (3) 10 - NOAA G (4)	11 - NOAA H (3) 12 - NOAA D (4)	11 - NOAA H (3) 12 - NOAA D (4)
Decommissioned	*table 1.3.2.a* 9 - NOAA F	9 - NOAA F	9 - NOAA F	9 - NOAA F	9 - NOAA F 10 - NOAA G

1) global data collected with 3 global stations
2) global data collected with 2 global stations (Lannion inoperative)
3) global data transmitted daily when possible - Global delays: 4 to 8 hours

4) regional data collection - regional orbitography
no data available

1.4 System performances

1.4.1 Throughput time for delivery of results

CLS throughput times for delivery of results are calculated in terms of the time taken to reach end users.
For each message received by the satellite, we compute the time elapsed between the recording of the message on board the satellite and the delivery of the results to the end user.
Table 1.4.1.a shows throughput time for delivery of results for stored data from NOAA-14 and NOAA-15, the two operational satellites.

	NOAA 14 - 15	NOAA 11-12
1 H	17%	3%
2 H	37%	15%
3 H	64%	30%
4 H	85%	55%
5 H	92%	70%
> 5 H	100%	100%

Table 1.4.1.a: Stored data throughput time

37 % of the data are available within two hours while 64 % of the data are available within three hours.

Only 30 % of the data are available within three hours from NOAA-11 and NOAA-12
as opposed to 64 % for the two operational satellites. This delay is due to the data set delivery times.

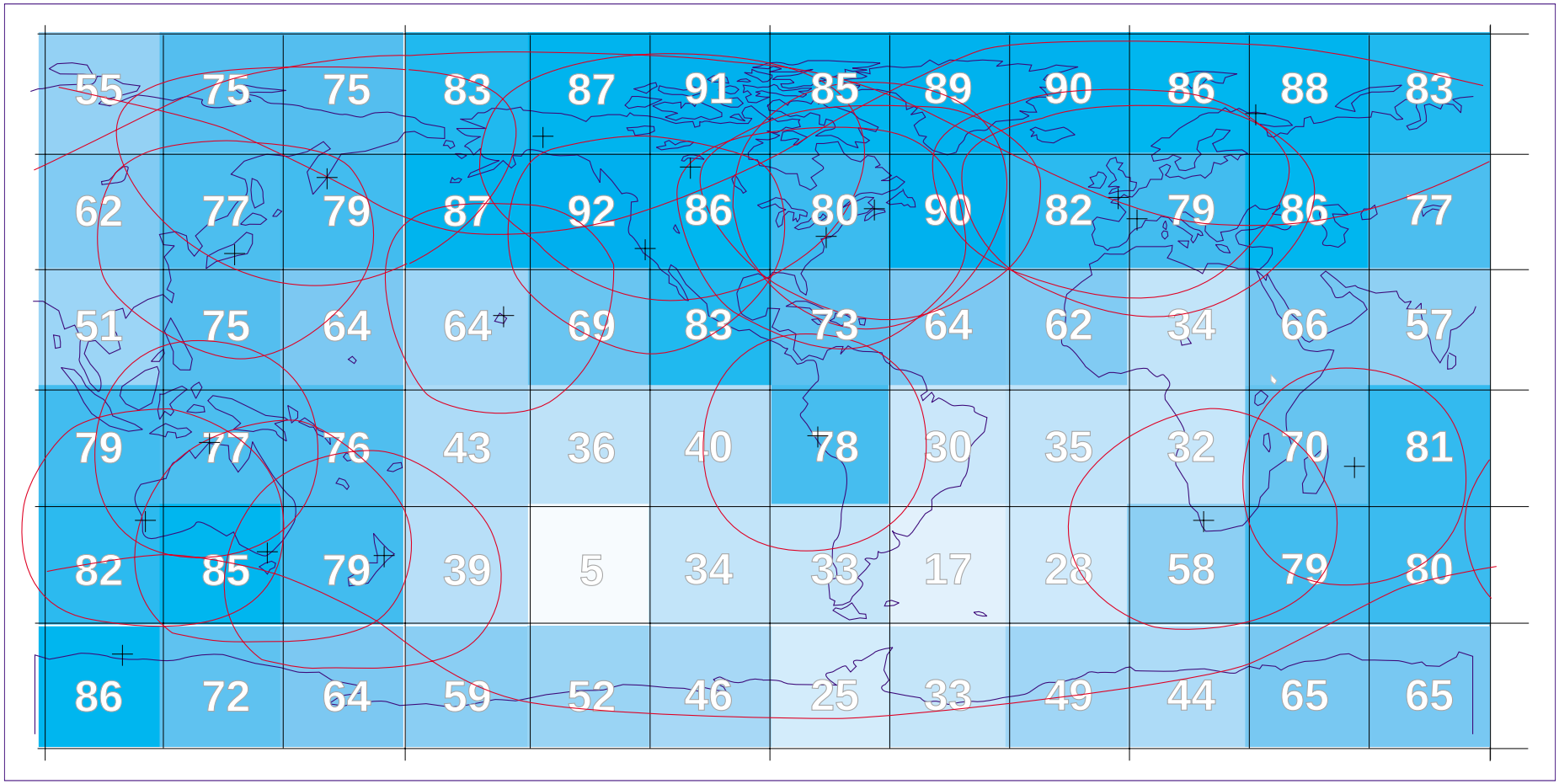
Figure 1.4.1.b shows the throughput time for delivery of results for real-time data from NOAA-15, NOAA-14, NOAA-12 and NOAA-11 and acquired by the 21 HRPT receiving stations.
85 % of these real-time data are available within 30 minutes.

	NOAA 14 - 15 NOAA 11-12
10mn	3%
15 mn	21%
20 mn	43%
30 mn	85%
45 mn	97%
60 mn	99%
> 60 mn	100%

figure 1.4.1.b: Real time data throughput time

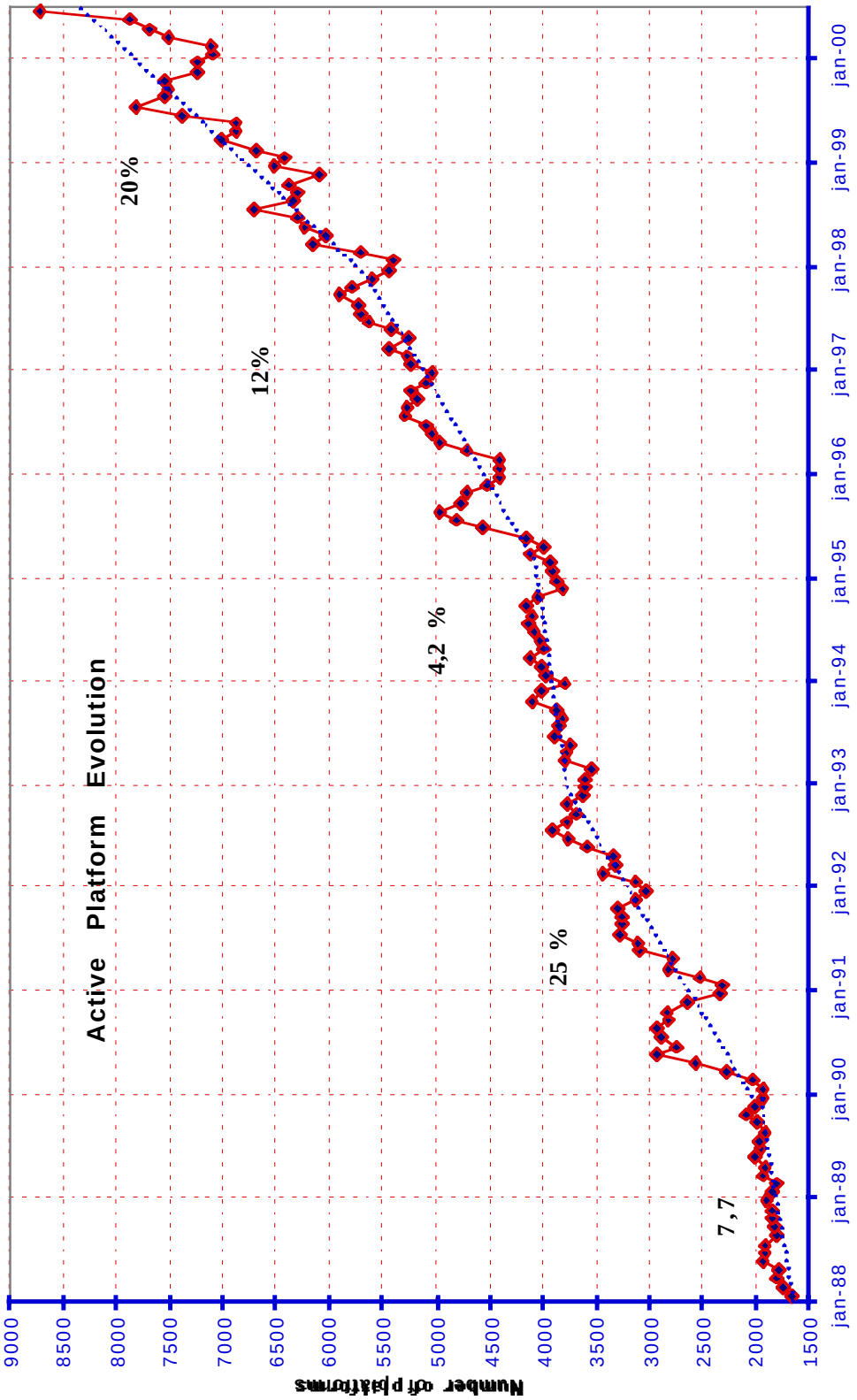
The throughput time for delivery of results for real-time data includes three main delays:
- the satellite pass duration, because we have to wait for the end of the pass to transfer and process the data set;
- the time taken to transfer the data set to the global processing centers. Most transfers go over the Internet. The transfer rate is getting better and better.
- The time taken to process the data set by the global processing centers, which is not significant (less than 30 seconds).

Percentage of real time data received in each geographical square (june 2000)



Active platform number evolution since 1988

An active platform is a platform seen at least once per month by the Argos system.



SYSTEM IMPROVEMENTS

1 - HARDWARE CONFIGURATION

Two new HRPT stations joined our network of ground receiving stations in 1999, in Murmansk and Petropavlosk, Russia. They are helping to improve Argos data throughput times.
The station in Hawaii, operated by the University of Hawaii, was replaced by the National Weather Service's receiving station.
The Monterey station, previously operated by the US Navy, was also replaced by the National Weather Service station.
Other projects are underway and we hope they will come to fruition this year. For example, we are discussing data reception agreements with Miami, Cayenne, and Singapore.

2.SOFTWARE CONFIGURATION

A great deal of work was done in 1999 to ready our software for the Y2K transition. This task involved checking over two million lines of code.
Two new services were added to enhance ADS data distribution:
- automatic transmission of data from a platform as soon as it enters a specified zone, and
-secure data transmission via a PGP protocol.
In addition to these software activities, work continued on two major projects to improve Argos system performance: Argos 2001 and Argos/Next.

3 - PROJECTS

3.1 Argos 2001

The purpose of the Argos 2001 project is to upgrade the entire Argos processing system. This ambitious project is vital for the long-term continuity of the Argos system and to better serve users.
This project is scheduled in three phases:

Phase I: development and implementation of a new user interface allowing users to access data and view and update technical files via a Web server. The System Use Agreements database will also be implemented during this phase. Data will be stored and managed by a database management system designed to be responsive to users' needs. Our objective is to give users more versatility in using the systems. Consequently, we will be expected to offer them quick and efficient support.

Phase II: Improvement and development of value-added services.
Phase III: Redesign of the Argos processing system.

Current status:
Phase I began at the end of 1998 and is underway.
The user management application is operational.
Development of the User Office application has been completed and rollout is scheduled for the end of 2000.
The Web user interface is in development and rollout is also scheduled for the end of this year.

3.2: Argos/Next project

The downlink messaging capabilities provided by the ADEOS II/Argos DCS equipment requires the addition of two new components to the current Argos ground segment:

A Downlink Message Management Center (DMMC)
located at CLS premises in Toulouse, France.
The DMMC's role is to centralize, validate, and schedule downlink message requests from users before transmitting downlink messages to the satellite (via a Master Beacon).

The Argos Web server developed within the scope of the Argos 2001 project will allow users to:
- enter requests and compile downlink messages for platforms carrying an Argos Next/Argos 3 receiver;
- monitor request status until completion.Note: a backup DMMC will be installed at

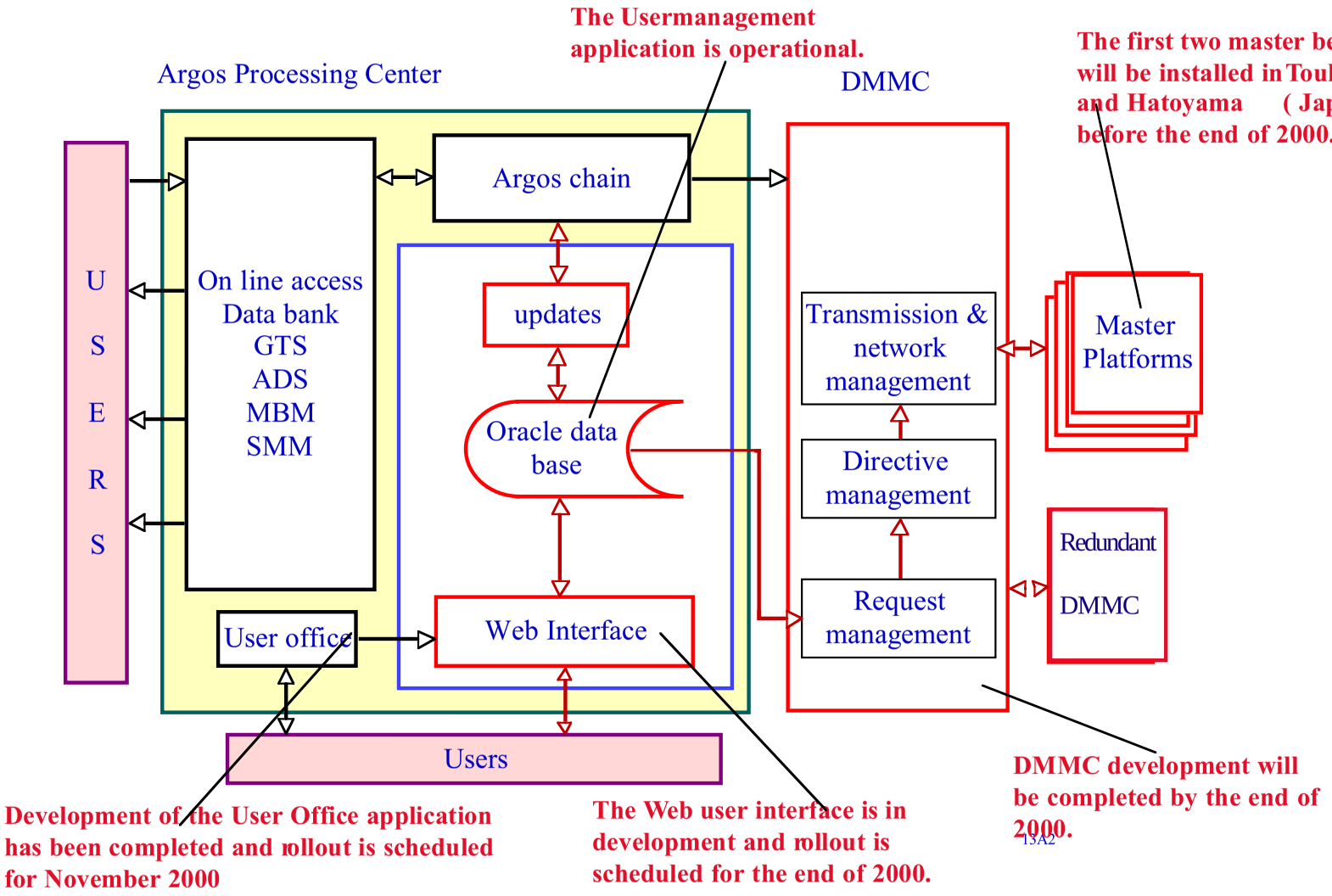


Figure 3: Argos 2001 and Argos Next projects

SAI Largo (USA).
DMMC development will be completed by the end of 2000.

A network of four master beacons,
located at strategic points around the globe, acting as the link between satellites and the DMMC.
The four locations foreseen for these beacons are:
Toulouse, Hatoyama, Fairbanks, and Spitsberg (TBC).

Development of the prototype is complete. The first two master beacons will be installed in Toulouse and Hatoyama (Japan) before the end of 2000.

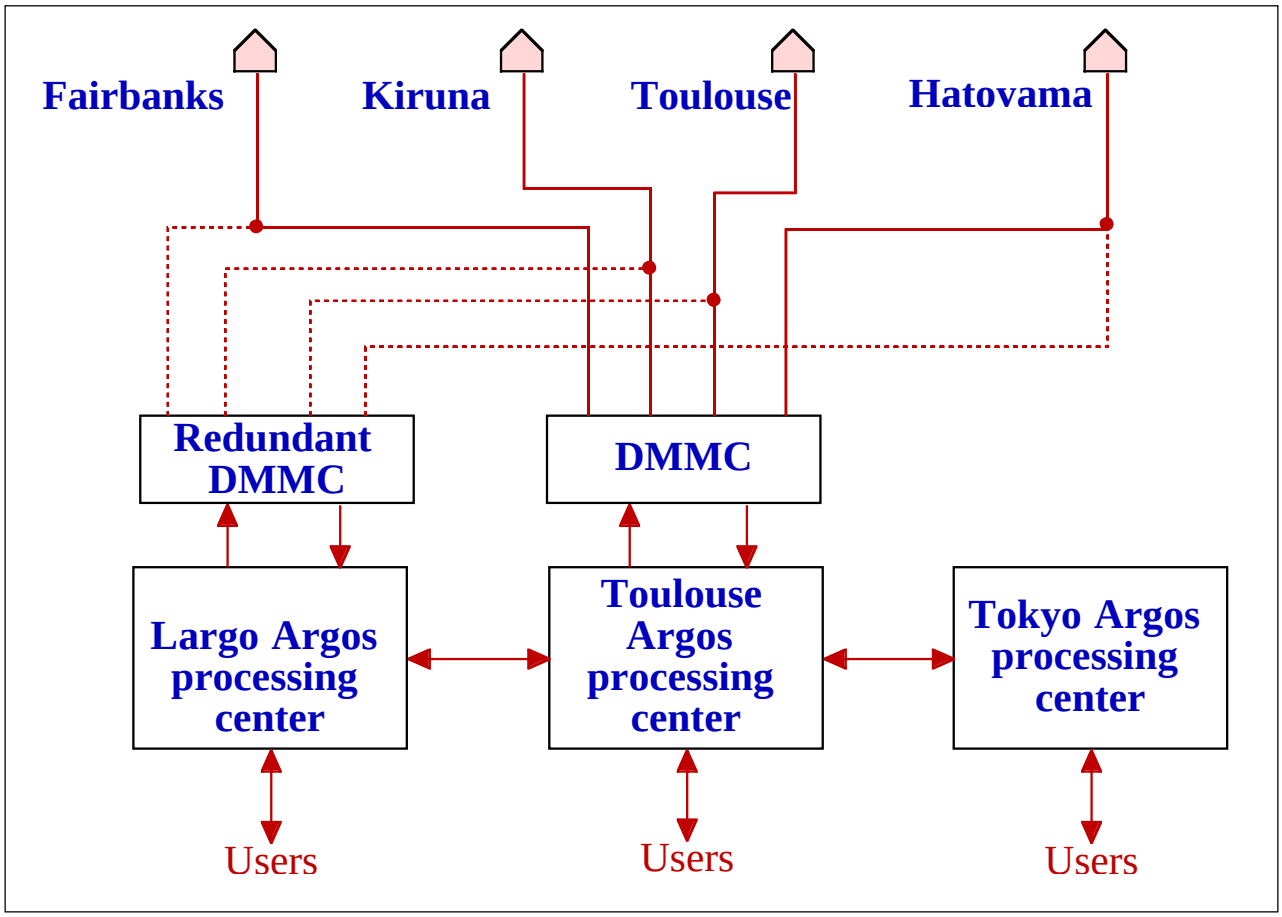


figure 3.2.a: Masterplatforms and Downlink Messaging Management Center

This project is also managing the current Argos software upgrade to support:

- file exchanges with the ADEOS II ground segment;
- ADEOS II spacecraft maneuvers when computing the User platforms locations;
- ADEOS II/Argos DCS Level-0 data and Housekeeping telemetry processing;
- processing of Argos messages related to the downlink messaging service;
- 28-bit ID numbers.

All these modifications have now been completed. The launch of ADEOS-II, previously scheduled for November 2000, has now been pushed back to November 2001.

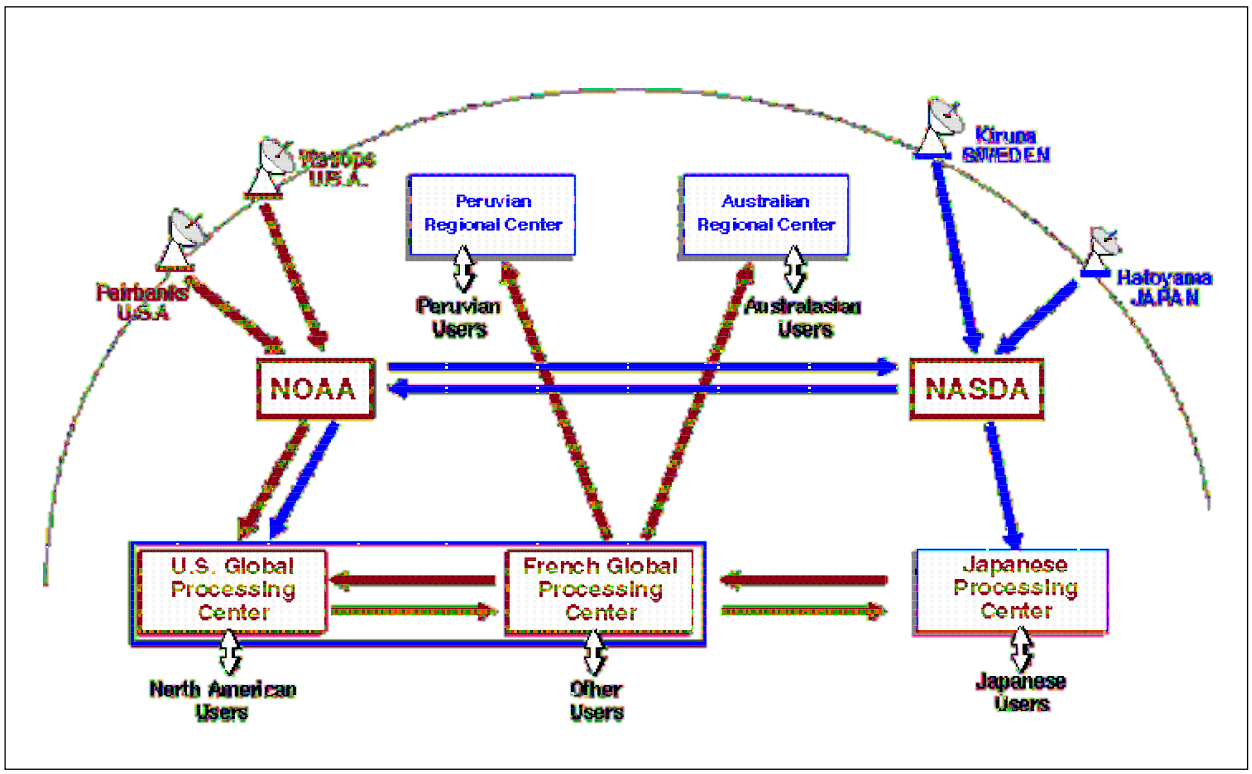


figure 3.2.b: ADEOS II/Argos ground segment

4. FREQUENCY SPREADING

Action Item N° 32-2-C from the Operation Committee (june 1998)

The Argos Operations Committee, recognizing the need to optimize the use of the frequency bandwidth, currently allocated to the Argos System 401.650 MHZ +/- 12 KHz, resolves:

1) that the central frequencies to be used by future Argos Data Collection Platforms be 401.650 MHZ, 401.648 MHZ and 401.652 MHZ. All three frequencies being equally used,

2) that CLS shall take the necessary measures for manufacturers to develop corresponding Argos DCPs,

3) that CLS should undertake the necessary studies to further optimize the utilization of the band allocated to the Argos System.

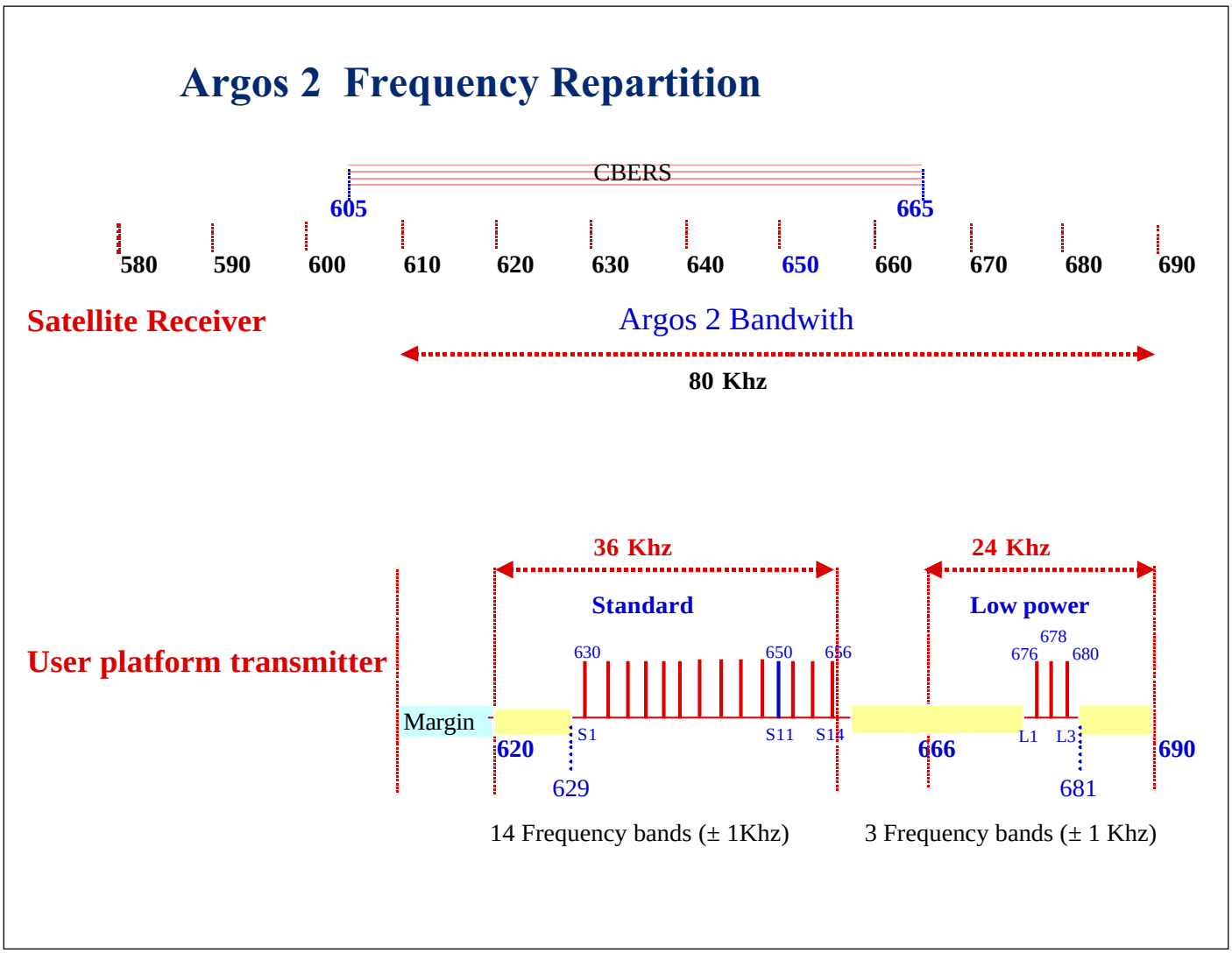
Transmitted frequency distribution

Taking advantage of the wider bandwith available with Argos 2 (80 KHz), a PTT transmitted frequency can now be set inside the Argos bandwidth between 401.629 MHz and 401.681 MHz.
In that bandwidth, we define 17 channels. Each channel is 2 kHz width.

According to the transmitter power, the transmitted frequency shall be set to:

- Channels S1 to S14 for transmitters which transmitted power is less than 3W but more than 500mW;
- Channels L1 to L3 for transmitters which transmitted power is less than 500mW.

Name of the Channel	Center Frequency MHz
S1	401.630
S2	401.632
S3	401.634
S4	401.636
S5	401.638
S6	401.640
S7	401.642
S8	401.644
S9	401.646
S10	401.648
S11	401.650
S12	401.652
S13	401.654
S14	401.656
L1	401.676
L2	401.678
L3	401.680



Periodic monitoring

1) CLS periodically monitors all PTT's in the system and the frequencies used by each one. The results show that a majority of PTTs are still using a frequency of ± 1 kHz with respect to the central frequency of 401,650 kHz.
However, following CLS action the percentage of platforms using this bandwith has been decreasing:

88% in 1997
78% in 1998
67% in 1999
58% in 2000

Unfortunatly during the four last years the total number of active platforms increased by 94 %. The result in still divergent.

Actions

CLS sent a letter to each transmitter manufacturer requesting that they take the necessary steps to move away from the central frequency at least as far as ±2 kHz.
This letter was followed by visits in May 1998 and April 2000 to each of the major manufacturers (those representing a significant share of production). The purpose of these visits was to pursue a dialog with them, collect first reactions and encourage a response to the letter.A general meeting was also convened in September 99.

> Meeting summary on the spreading of transmitter frequencies across the available bandwidth:
>
> The need for spreading the Argos transmit frequencies across the available is based on the fact that the majority of transmitters in service today are operating at the central ARGOS frequency of 401.650MHz, and that spreading the transmit frequencies across the bandwidth will enable a higher the number of messages to be received.
>
> There was general agreement among the participants that the concept of frequency spreading is acceptable. It was also felt that this would very likely have some impact on the cost of building a transmitter.
> The timing of the spreading will be in phases that are not yet defined, although manufacturers are strongly encouraged to begin using frequencies S10 and S12 (which are +/- 2 kHz about the center frequency of 401.65 MHz) immediately then eventually spread frequencies across the entire available band.
> The timing of the frequency spreading over the Argos-2 bandwidth will most likely be applications dependent and will be driven by, among other things, **the launch of NOAA L** and the total number of satellites that are available for use.
> For low power applications it is expected that using only three frequency channels (401.676, 401.678 and 401.680 MHz) will be adequate for the mid-term future since these applications typically have long duty cycles.
>
> The overall process of frequency spreading will be implemented cooperatively between Argos and the manufacturers. Progress will be monitored.

3) Next step should be to take decisions to accelerate the frequency spreading process after the launch of NOAA L.

..... G-5. Argos Il frequency policy update

The situation in the Argos 1 frequency band with slightly improved over one year. The percentage of the total number operations in the central channel (511) decreased from 65% to 60%. The actuibs towards manufacturers were not very successful except with the main French manufacturer which is supplying platforms to CLS. This leads to think that the action should be reoriented toward the users by two means : financial incentive and allocation of channel with id numbers with possible derogatÎon.

The US ROC and the JTA chairman objected that financial incentive will complexify the tariff structure which does not need it but agreed that this could be efficient. The meeting recommended that a proposal be prepared by CLS in cooperation with the JTA chairman.

5: REVIEW OF USER'S REQUIREMENTS

Data Buoy Cooperation Panel (1999)

5.1 The chairman of the DBCP reported on the main conclusions of the fifteenth session of the panel (including the technical workshop), Wellington, 26-29 October 1999, which were of interest to the JTA.

5.2 The following specific recommendations were made by the panel session to the JTA:

(i) There is a need to improve data reception and dissemination within the International South Atlantic Buoy Programme (ISABP), which could be effected through the establishment of connections between existing S-band stations potentially available to support the programme and the Argos processing centres. CLS should undertake this work as part of the Argos development programme;

Action:

Three LUTs are in operation in South-Atlantic:

- Two LUTs provided by Navoceano are installed on Marion and Gough Islands. They are operated by SAWB. Datasets are relayed to SAWB in Cape Town. Navoceano sent Y2K updated equipment early this year and the stations are operating properly locally. There are still some communication problems to be resolved before getting the data to Argos centers.
- A LUT has been installed in Falklands but there are no lines connecting it (yet) to the Falklands-UK data (internet) link.

Item open.

(ii) An agreement should be concluded between the Argos Operations Committee and the Brazilian Space Agency (INPE) to integrate the planned Brazilian 3-satellite system with Argos-type equipment into the Argos system, in view of the potential benefit of such integration to DBCP programmes;

The Operations Committee endorsed these actions as part of the Argos development programme.

C . Gal (Operations Committee Co-chairman made a brief presentation on on-going discussions with the Brazilian space agency INPE, regarding a possible cooperation between the Brazilian DCS and the Argos DCS.

The Argos Operations Committee, confirmed its interest in continuing these discussions.

The Operations committee proposes to take the opportunity of the next CEOS meeting to review the progress made in the discussions. In order to inform INPE of this proposal, the co-chairs will send a letter to his INPE Director, Mr. Barbosa.

(iii) The JTA should continue to emphasize cost control, increased system efficiency and greater usage of data collection and distribution systems within Argos, in view of the likelihood that there would be few new sources of funding for ocean observing networks in the forseeable future.

Item open.

5.3 The JTA supported these recommendations. CLS/Service Argos was requested to take the necessary actions in response to the needs identified, in conjunction with appropriate bodies.

Argos GTS sub-system developments (from the report of the DBCP Technical Coordinator)

The following developments have been conducted with regard to the GTS sub-system:

Small improvements

STD format: GTS sub-system is capable of encoding the data in non-standard WMO codes for direct distribution to Argos users. Parallel distribution in standard WMO codes is of course possible. Two codes are available for direct distribution, one called SIMPLE, and the other STD. STD was developed during the intersessional period and permits to encode more lines of information than SIMPLE. Both are ASCI formats with fields separated by commas.

BUOY code, housekeeping parameters: BUOY permits encoding of 3 housekeeping parameter. Since housekeeping parameters are optional, when an housekeeping parameter is absent, it can be removed and the subsequent parameter takes its place. Hence, when decoding BUOY reports, when more than one are transmitted by a buoy, the housekeeping parameter number is not reliable to identify a given one (e.g. if both battery voltage and internal temperature are transmitted, they become housekeeping parameters #1 and #2 respectively, but if battery voltage is rejected by the QC, then internal temperature becomes #1). A modification of the BUOY code encoder was made to permit encoding of housekeeping parameters as missing data (i.e. coded with '////') in order to keep the numbering.

BUOY code, location date: For historical reasons (i.e. practice with the old DRIBU code), location date is indicated in the BUOY reports only if the age of the location is greater than 30 minutes. A request was made by Météo France to encode the location date systematically in the BUOY reports. Interpretation of the regulations from the WMO manual on codes actually permit to do this so a small modification of the BUOY code encoder with the Argos GTS sub-system was made.

Specific algorithm for TAO moorings

No decision has been made by PMEL in this regard yet so CLS did not evaluate required developments.

GTS distribution of sub-surface floats

This issue was discussed at the last DBCP session where it was reported that developments required for processing and distributing on GTS sub-surface float data had started. This followed requirements and request for GTS distribution of sub-surface float data expressed by a few float operators, namely France, Japan, UK, and Australia.

Specifications have been written based upon existing formats of floats deployed by JMA (PALACE), Woods Hole (PALACE), and IFREMER (PROVOR). Scheme uses the existing Argos GTS sub-system. News system was put in place operationally in March 2000. Tests have been conducted until July 2000 using Japanese, UK, and Australian floats. Specificities of those floats lead to extra minor developments. Basically, the new system includes:

- Processing profile points, up to 120 initially, each point comprising up to 10 sensors (e.g. depth, conductivity, temperature, salinity).
- Delayed mode GTS distribution (e.g. waiting until a profile is complete after several satellite passes before actually distributing the data on GTS).
- New types of calibration curves (e.g. depth table, polynomial function P(X,Y,Z)

using main sensor plus two compensating sensors).

And is open to new possibilities that might be developed later:

- Dynamic Argos message formats: Argos message format is described to some extent by the message itself. This permits high compression of the data. However, a limited number of dynamic formats will be recognised and proposed as standards. So far, no standard has been proposed.
- Quality control. Specific QC checks are not defined yet, but doors will be opened in the system to easily permit this. CLS oceanography group will develop specific QC procedures.

REVIEW OF THE STRUCTURE OF THE TARIFF AGREEMENT AND RELATED MATTERS

1 - BASIC FUNDING AGREEMENTS

1.1 - Income

1.1.1. Basic principles adopted by JTA-XVII for the 1998 and 1999 JTAs

The JTA-XVII meeting agreed that the basic principles for the 1998 and 1999 at least should be:

(i) that each ROC had essentially a fixed amount of money to pay to Argos for 1998, the total of which would most likely cover Argos operating costs for that year, based on an unchanged cost per PTT year (see agenda item 6),

(ii) that for this amount each ROC would be allowed a certain percentage increase (bonus) in PTT year usage in 1998, nominally 35%, without further charge or penalty,

(iii) that this increase could be compounded over two years, provided the sum guaranteed to be paid to Argos did not decrease in 1999 from that guaranteed at JTA-XV1I,

(iv) that if the PTT years finally agreed on 15 January 1998 and/or 1999 by each ROC amounted to less than the PTT/years confirmed and recorded at the present meeting by the ROC, then the bonus would no longer apply to that country.

1.2. Basic agreement on accumulated debt

In response to a request from the JTA, the 25th Argos Operations Committee (1991) established a special Working Group on Pricing Policy to examine the question of whether inflation should be applied to the Argos operating losses accumulated during the period 1 January 1984 to 31 December 1990.
The solution proposed by the Working Group was:
- the JTA share of the accumulated losses (FF 34.78M) should not be re-evaluated for inflation, provided that it is fully repaid by the end of the ten-year period 1 January 1991 to 31 December 2000;
- the non-JTA share of these losses will be re-evaluated for inflation, and this re-evaluated sum will eventually have to be repaid through the income from non-JTA users; and

- in the event that the JTA share is not repaid within 10 years, the Argos Operations Committee will be required to provide a further ruling regarding a re-evaluation of the remaining debt after that period.

1.3 Recommendation from the Operations Committee

33rd Operations Committee (july1999)

G.1.1: Report on JTA meeting
… " D. Painting, JTA Chairman, reported on the main results of the 18th meeting of the Argos Joint Tariff Agreement, Marathon, 19-21 October, 1998. He noted that the formulation adopted at JTA 17, La Réunion, October 1997, to run for two years, had led to a deficit of operating costs over revenue of some FF. 1.7M for 1998, hence JTA18 decided that steps should be taken in 1999 and after JTA 19, to achieve a balance of income and expenditure in the very near future, whilst retaining the principles established at past meetings.
The Operations Committee agreed that it was essential that the Tariff Agreement be modified, within the current guiding principles and within the framework of co-operation between CLS/Service Argos and the users, with the objectives of obtaining a balance of income and operating costs and eliminate the current deficit as soon as practicable in a period not to exceed five years…."

34rd Operations Committee (july 2000)

G.1.1: Report on JTA meeting
... Recalling the guidance given by the 32nd Operations Committee meeting, the JTA Chairman outlined the plan adopted by JTA XIX to address the deficit of income on expenditure that had accrued since the 1998 Joint Tariff Agreement.
The Operations Committee approved the general principle of the plan whilst stressing the need to monitor and adjust the variable factors employed in the hight of actual experience.

G.1.5: Financial status:
M. Cazenave reviewed the Argos financial status.
A highlight was a proposal to separate the JTA operating cost obligations from the total effective operating cost of Argos. This approach would enable the JTA to maintain more control of their costs during the 5 yr. Plan agreed to at JTA-XIX
. The committee endorsed the approach and agreed that it should be proposed at JTA-XX.

2- XIX JTA MEETING 5 YEAR MANAGEMENT PLAN DECISION

2.1 5 year management plan

The meeting noted the view expressed by the Argos Operations Committee, with which it agreed entirely, that efforts should begin immediately to address this deficit problem, and eventually to eliminate entirely the accumulated Argos operating losses.
After considerable discussion, the meeting finally agreed on a five-year plan (2000-2004), firstly to eliminate the annual operating deficit, and secondly to effectively remove the accumulated losses.

The essential features of this plan are:

(i) An annual inflation of 2% would be allowed in Argos operating costs;
(ii) The JTA share of these operating costs would decrease from the existing 60%, initially by 2% in 2000, and then in increments of 1.5%, to reach 52% in 2004;
(iii) The monthly Active Platform Fee would be phased in over the period, beginning at FRF 10 per active platform in 2000 to reach FRF 50 in 2004;
(iv)The basic price per PTT-year would also be increased by FRF 200 per year, beginning in 2000 to reach FRF 27,000 in 2004;
(v) The Unused ID Charge would be phased out over the period, subject to annual review (see also paragraph 6.2 above);
(vi)Free access to the third satellite would be provided immediately for animal trackers, within limitations on number of locations; the situation with regard to access to the third satellite would be reviewed at the next meeting, with a view to its eventual introduction for all users.

2.2: Five year plan projection table

Table 2.2 shows the projected resulting figures (for 1998 and 1999 real figures are used)
Details of the table are as follow:

Line 2: Basic Argos operating costs inflated at 2% per year (according to i above) excepted 1999 where inflation was 1.9%.
Line 3: JTA share percentage according to ii above
Line 4: JTA basic operating costs resulting from the share
Line 5: JTA predicted income using today tariff structure
Line 6: Prediction of the number of active platforms
Line 7: Active PTT fee per month (according to iii above)

Line 8: Annual fixed fee income resulting from lines 6 and 7
Line 9: Prediction of the PTT.Year contracted number (it should be noted that 2000 flevel ,at 1108 PTT.Year is lower than the initial prediction of the plan)
Line 10: Δ PTT.Year fee increase (according to iv above)
Line 11: Δ income resulting from lines 9 and 10
Line 12: Annual balance:

Line 12= Line 4 -(Line 5 + Line 8 + Line 11)

Line 13: Accumulated loss projected from 1999 figure (4.4 MFF)

	YEAR	1998	1999	2000	2001	2002	2003	2004	2005
1	**Inflation**		1.8%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
2	**Total MFF** (Inflated at 2% per yr)	56.04	57.05	58.19	59.35	60.54	61.75	62.99	64.25
3	**JTA Share**	60%	59.5%	58%	57%	55%	54%	52%	52%
4	**JTA Cost (MFF)**	33.6	33.9	33.8	33.5	33.3	33.0	32.8	33.4
5	**Non inflated income (MFF)**	31.4	31.2	31.5	31.5	31.5	31.5	31.5	31.5
6	**Number Active Ptts (prediction)**			4000	4500	5000	5500	6000	6000
7	**Active PTT fee per month (FF)**			10	20	30	40	50	50
8	**Fixed Fee income (MFF)**			0.5	1.1	1.8	2.6	3.6	3.6
9	**PTT.Year contracted nb**			1108	1124	1124	1124	1124	1124
10	**Δ PTT Year Fee (FF)**			200	400	600	800	1000	1000
11	**Adjustment (MFF)**			0.22	0.45	0.67	0.90	1.12	1.12
12	**Loss (MFF)**	1.72	2.68	1.55	0.51	-0.68	-2.00	-3.47	-2.82
13	**Accumulated Loss (MFF)**	1.72	4.40	5.94	6.45	5.77	3.77	0.30	-2.52

Table 2.2 Five year plan estimates of costs and incomes

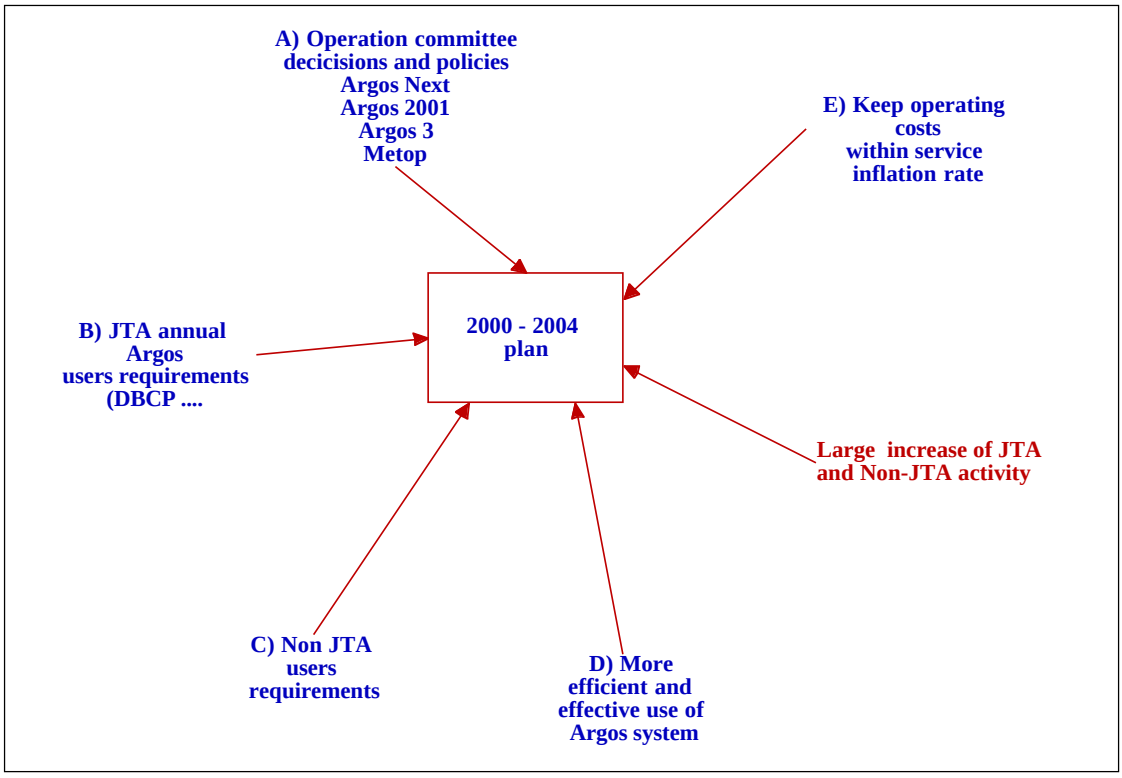
Note:
1) At the 19th JTA meeting, CLS/Service Argos did a proposal for a five years management plan (see § 5.5.3 - Figure 5.5.3) where the percentage of JTA share was 55% in 2004 instead of 52% in the above table.

2) At the 17th JTA meeting CLS/Service Argos proposed (see § 4-1 :**framework text for change to the JTA contract:** ..... CLS/Service Argos is prepared to make avalaible a 10% increase in system usage for Science each year over five years while maintaining operating costs at the rate of inflation or less.

The percentage decided by the JTA was 82% (compounded bonus) on two years.
It should be noted that the above two decisions are creating the conditions for a much larger increase of the consumption in PTT.year than we predicted.
The result is that an increase of the capacity of the processing centers will be needed (with the corresponding investments)in the near future.

2.3: 5 year plan operating cost assumptions and constraints

Figure 2.3 shows the cost assumptions and the constraints which are to be taken in account for the management of the Plan



A) Operation Committee decisions and policies(CNES, NOAA, NASDA, and EUMETSAT)

This leads to investments for:
- Operation of NOAA 14 (J), 15 (K) and 12 (D) (satellites whaving different data transmission formats)

- Operation of the two way capability to begin after the launch of ADEOS II in 2000.
- Operation of a Global Processing center in Tokyo
- Operation of an Argos processing chain able to process data received from 3 different satellites (NOAA, ADEOS, METOP) equipped with a two way capability.

B) Annual Argos JTA user requested requirements

These requirements are included by the JTA within a development program priority list (see chapter 4: Development projects of the Argos system requested by the JTA) are to be planned and developed taking in account the Argos incomes and expenses balance.

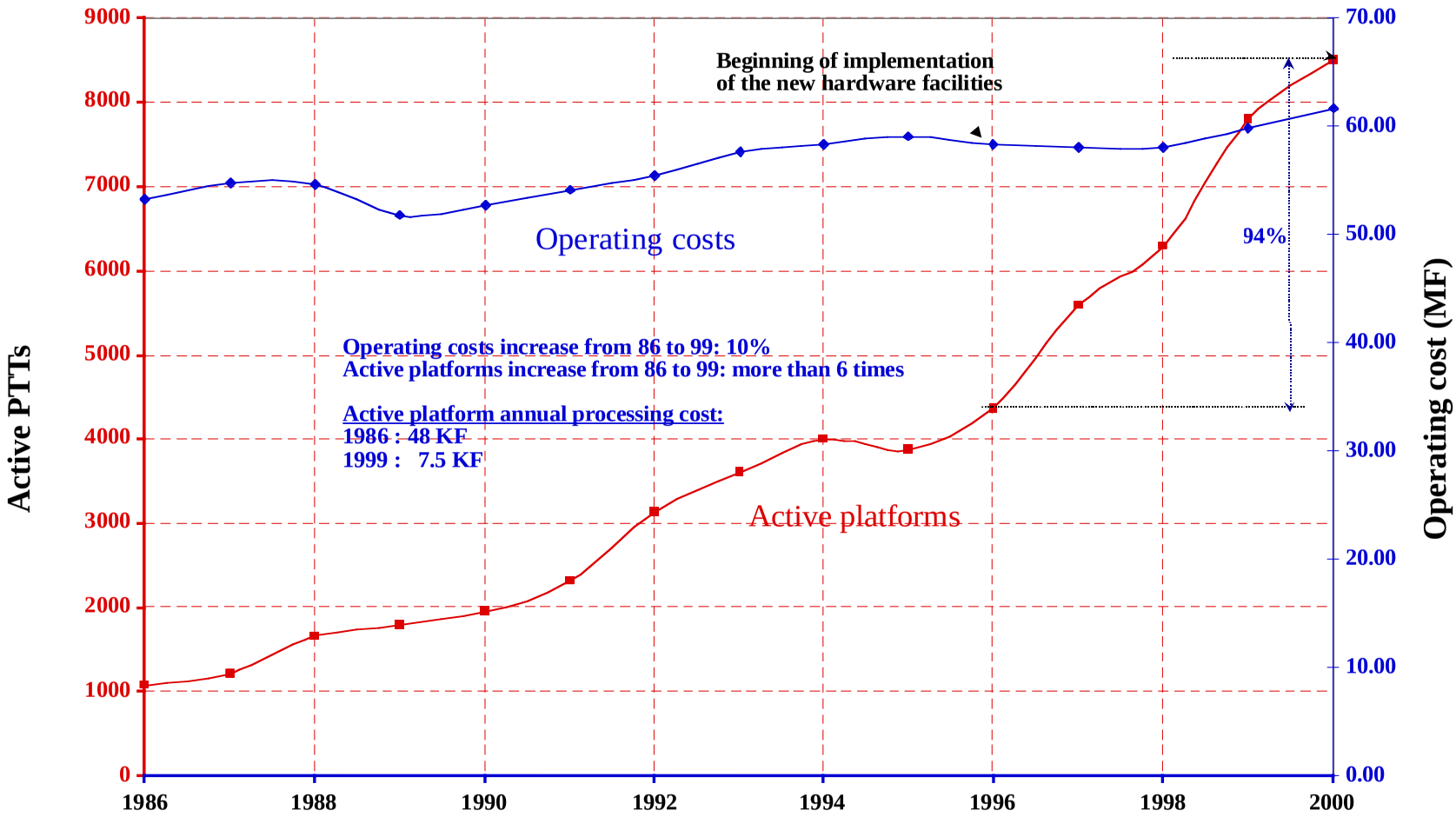
C) Argos non JTA User requirements

In order to retain non-JTA users (and their support of the system), services, technical developments, and system enhancements which address their requirements has to continue.

B) Primary objectives of JTA are to be taken in account
by making a more efficient and effective use of the Argos system and being prepared to support major international programs relating to global climate and global change studies, operational meteorology and large-scale ocean research.

D) Keep operating cost within the inflation rate

It is necessary to amortize the investments in Argos 2001, ArgosNext and Argos 3, on a 10 to 11 year period.
The period of operation of the Argos preceding chain which, was installed in 1986 and still in operation, is of this order of magnitude.



Graph 2.1.3: Operating costs and number of active platform evolution

C) Large increase of JTA and Non-JTA activity:

Graph 2.1.3 shows a 94% increase in the number of platformswhithin the last four years
The graph shows also that over 13 years, operating costs were practically constant, yet the system was upgraded while undergoing a nearly eight-fold increase in the number of active platforms.
Management of costs has been helped by successive multi-year commitments by the JTA meeting and CLS/Service Argos, enabling planning of investments and staff growth.

This large increase in the number of active platforms leads to:

A) an automatic decrease of the JTA operating cost part from 60 % to 59.45%

B) a proposal for modification of the cost management rules between JTA and Non-JTA in order to keep JTA operating cost within the inflation rate.

Although in the preceding years we invested in technologies, with the objectives of:

1) providing more processing and communication power, and thus handling more platforms,
2)developing interfaces that would reduce staff costs,
3)giving much more flexibility to the processing chain to face the rapid changes in users needs,

a 94 % increase of active PTTs within the last four years doesnt allow us to keep the operating cost within the inflation rate.

This proposal separates the JTA operating cost obligations from the total effective operating cost of Argos.
The JTA operating cost for 1999 would be calculated as follows:
1999 JTA operating costs = 1998 Total operating cost * 1999 Inflation rate (1.8 %) * JTA part percentage of total cost (59,45 %)

The figures would be :

56.04 MF * 1.018 = 57.04 MF
57.04 MF * 59.45 % = 33.91 MF

This proposal would enable the JTA to maintain more control of their costs during the 5 yr. Plan.

This proposal was presented at the 34th Operation Committee (june 2000) which endorsed the approach and agreed that it should be proposed at JTA-XX.

3 - FINANCIAL STATEMENT

3.1. Yearly Expenses

3.1.1: 1998 and 1999 Actual expenses

1998 Actual expenses

Personnel related	30.88 MF
Others:	25.16 MF
Total:	**56.04 MF**

1999 Actual (Inflation 1.8%)

Personnel related:	32.24 MF
Others:	26.55 MF
Total:	**58.78 MF**.

3.1.2. Detail on 1999 Expenses (in millions of French Francs)

A		Communications	2.18
B		Maintenance and consummable	1.99
C		General & Administrative (Building, power, logistics..)	7.53
D		Promotion and Marketing	4.72
E		Financial costs and taxes	5.06
F		Amortization	5.07
G		Salaries	29.07
H		Management & human ressources administration	3.16
		Total:	**58.78**

table 3.1.2: Detail on 1999 Expenses (in millions of French Francs)

3.1.3. Details of «Amortization» items

CLS + SAI Amortization details	1996	1997	1998	1999
SOFTWARE				
S/W to make computer centers operational	39	39	0	0
SOCC connection				
Regional Processing Center	101	115	102	42
Monitoring System use factor				
New location - new ARGOS accounting system	330	179	102	0
GTS	0	0	0	0
IDS				
TOTAL	470	332	204	42
Argos on ADEOS (Part of) & 2001 projects		952	2 100	2100
HARDWARE				
Orbit determination Network	0	0	0	0
US. GPC Hardware	696	745	650	489
French GPC Hardware	1 852	1 386	1 541	1871
VAX Development	413	120	0	0
Transatlantic line (Equipment)	0	0	0	0
TOTAL	2 961	2 251	2 191	2360
General and Miscellaneous				
µ computers	158	218	53	0
Promotional Hardware	134	205	7	0
Office furniture- Safety - General equipment	507	278	579	566
TOTAL	799	701	639	566
GRAND TOTAL	**4 230**	**4 237**	**5 134**	**5 068**

table 3.1.3: Detail on amortization items in kilo - francs

3.2.1. Total revenue

The total revenue for 1999 was 60.9 MF

3.2.2. JTA revenue

The JTA revenue for 1999 was 31.24 MF

3.3. JTA accumulated losses and annual balance

3.3.1. JTA accumulated losses

The JTA reduced the accumulated debt from 1991 to 1996 and canceled the remaining debt at the end of 1996 (Four years in advance compared to the plan)

3.3.2. JTA annual balance for 1998

JTA operating costs and incomes for 1998 were respectively 33.62 MF and 31.39 MF which created a deficit of 2.23 MF.
This deficit was reduced to 1.71 MF by the existence of 0.52 MF coming from 1997.
This operating deficit was due to primarily:
- a shortfall of PTT-years in the base figure used at JTA-XVII for the implementation of the principles (1119 PTT-years) below the number actually required to balance the Argos operating costs In 1998

- no allowance was made in the principles for the effects of inflation on the operating costs in 1998 and future years.

3.3.3. JTA annual balance projection for 1999

JTA operating costs and incomes for 1999 were respectively 33.91 MF and 31.24 MF which brought the deficit to 2.67 MF.

3 - OTHER ISSUES RELATING TO ARGOS FUNDING

3.1. Recycle of unused ID numbers

3.1.1. JTA decisions

The JTA-XV meeting (1995) meeting decided to implement a charge for long-unused (unreturned) Argos IDs. This charge was designed to encourage the return of such IDs and thus help to alleviate the potential future shortage of IDs.
The JTA - XIX meeting (1999) decided to continue to operate the charge, but to review it at future meetings with a view to phasing it out completely within five years.

3.1.2. Decision implementation timetable:

1) **By 31 January 1997**, CLS sent out letters, to request return of unused ID's and to notify users that they would incur charges from 1 January 1998 for all unreturned IDs which were unused during the preceding 2 years, i.e. from 1 January 1996;
2) **Conditions:**
- The charge for unused IDs is 25 FF per ID per month;
- Charging are be carried forward on a rolling basis at 2-month intervals
- CLS included this charge in the 1998 catalogue of prices, with the charge to be billed directly to users.

	Number of Assigned IDs to JTA	Number of Active IDs within JTA	Number of JTA Inactive IDs since two years	Nb of IDs being recycled	Nb of IDs ready for distribution
End of 1996	16400	3700	5000		
July 97	15900	3900	2900	1100	3600
July 98	14742	4300	1120	1900	3100
August 99	15257	4400	3650	1260	1560
August 00	15654		3899	697	1374

3.1.3. Status evolution of unused ID numbers

According to table 3.1.3, CLS has in August 1999, 1374 IDs ready for distribution out of the total of 32768.
The XIX JTA meeting, accepted to expand to a new total of 100000 IDs by changing from the existing 20 bits to a 28 bit ID.

This change now is scheduled for october 2000; it necessitates modifications to hardware and software in both the processing system and PTTs, and results in a loss of 8 data bits in the data portion of the Argos message.

Existing programmes will not be directly affected, and will be able to retain existing 20 bit ID allocations.
Only new commitments (new programmes or expansions to existing programmes)will require action to convert to the new ID structure.

CLS/Argos will make every effort to persuade users who do not require the full 256 bits for data, to return unused 20 bit IDs to CLS, so that some could be recycled as 28 bit IDs;

3-4 Free access to the third satellite

Free access to the third satellite would be provided immediately for animal trackers, within limitations on number of locations; the situation with regard to access to the third satellite would be reviewed at the next meeting, with a view to its eventual introduction for all users.
At the JTA meeting in Athens in 1993, CLS suggested that processing of data from the third satellite could be developed in an effort to meet user requirements. This would have meant including the corresponding service as a standard JTA service.

This proposal was refused at the JTA meeting, so CLS decided to develop a Value-Added Service to offer users access to the third satellite. The investment and operating costs of this service would be recovered by levying an extra charge on a per-usage basis.

In 1999, animal trackers were granted free access to the third satellite.
It was decided to offer this advantage to a single category of user because of its limited impact and its usefulness for animal trackers.

However, offering all users access to the third satellite is an altogether more serious issue, because it would:
1) significantly alter the rules regarding system balance contained in the agreements governing relations at both Operations Committee and JTA level;
2) mean a big loss of revenues and require significant extra investment (to increase processing capacity by 25%) and personnel, at a difficult time when a major plan is being implemented to absorb the increasing number of platforms (94% growth in four years with constant costs);
3) delay implementation of frequency spreading by allowing access to an older-generation satellite for users who have never shown much interest in this service, rather than encouraging them to use new and less crowded frequencies.

3-5 Free access to A/B class location

The meeting noted the requirement of animal tracker users for access to additional locations (class A/B), currently available at extra charge. It requested CLS to review the potential impact on its operations and costs of providing free access to these locations, and to report on the matter to the next meeting. At the same time, ROCs were requested to canvass their animal tracker users on the actual extent of their requirements in this regard, and to also report on the matter to the next meeting.

Access to class A/B locations is a value-added service designed to meet a specific requirement for certain users. This service lets them obtain locations where low-power transmitters would otherwise yield poor results. Better results are achieved using special processing techniques to push the Argos system beyond its initial performance specifications.

This service involves extra effort to operate it, given the difficulties it poses and the more frequent contact required with users than for standard service.

Value-added services are based on the principle that new services are developed where a perceived user need exists (i.e., the new service is a step forward for users), and where we can expect to recover our costs.

This principle allows us to sustain the momentum of the Argos system's evolution by addressing specific needs, provided that we can recover the investment and operating costs associated with a new development.

Free access to class A/B locations for animal trackers poses similar problems to those posed by access to the third satellite, because:

- it is a value-added service not covered by the agreements governing relations at Operations Committee and JTA level;
- it would mean a big loss of revenues and require significant extra investment (to increase processing capacity) and personnel;
- such efforts do not match the objectives of the JTA's plan, as CLS is obliged to meet demand from the surging number of platforms (due to the success of the Bonus strategy) while keeping costs constant.

4 - DEVELOPMENT PROJECTS OF THE ARGOS SYSTEM

These projects are presented in three categories:

4.1. Projects Completed:

Automatic Distribution System
New computers in Service Argos Inc.
Japanese Regional center (step 1)
New ID number strategy
Back up line of the French center
New GTS subsystem (step 1 and 2)
Connection of US center to Hawaii S Band station
Connection to the BOM telemetry from Perth
Improvement of location process
Argos GPS project
US center disks change
French processing center upgrade
US processing center data distribution over Internet
Australia real time distribution on GTS chain in Toulouse
Upgrade of the Australian center hardware
Third satellite real time data processing from Lannion and Australian antennas
US processing center upgrade
French processing center connected to Internet
Software migration on Alpha computers
Increased on-line data access (10 days)
Argos 2 (K,L, M) adaptation (Capacity, sensitivity, receiving stations, test....)
ID numbers administration
Requested by JTA (DBCP)
Reunion island real time distribution onto GTS chain in Toulouse
South Africa real time distribution onto GTS chain in Toulouse
Increase the size of Argos data base.
On-line access to GTS Technical file.
Access to Argos data using CD ROMS
Data flow control facilities
On-line and up to date Argos documentation
Japanese distribution center upgrade
Multi satellite real time data processing from Landover antenna
Extension of ID number processing capability
Direct distribution of buoy data to Météo France in La Réunion
Data processing of JAMSTEC TRITON moored buoys
Specific algorithms for new Argos XBT devices

4.2. Projects Under Development (or to begin in 2000)

ADEOS II/Argos processing chain project
Argos 2001 project (Argos processing chain renewal) step1
On-line access to Argos technical files
On-line access to ADS technical files
GTS distribution of sub-surface floats
Improved delays (open action item)

4.3. Projects under study

Error detection/correction codes
Requested by JTA (DBCP)
Data sharing facilities
GTS Subsystem Quality control
Access to both GPC.
Specific algorithm for TAO moorings